The ADVERTISERS' INDEX

A

Ajax Iron Works
Alco Products, Inc.
Allegheny Steel Co.
Allis-Chalmers Mfg. Co.
Allis, Louis Co., The
Allsteel Products Mfg. Co., Inc., The.
Aluminum Co. of America
American Cable Co., Inc.
American Cast Iron Pipe Co.
American Iron & Machine Works Co.
American Meter Co. 6
American Radiator Co.
American Rolling Mill Co., The
American Sheet & Tin Plate Co.
American Stainless Steel Co.
American Steam Pump Co.
American Steel & Wire Co.
Inside Back Cover
American Steel Works
American Tank & Equipment Corp.
American Well Works, The 105
Anchor Post Fence Co.
Armstrong Machine Works
Athey Truss Wheel Co.
Axelson Mfg. Co., Ltd. 59
Ayer & Lord Tie Co.

B

Badger, E. B., & Sons Co.
Badgett Steam Lubricator Co.
Baker Oil Tools, Inc.
Barber-Greene Co.
Baroid Sales Co.
Barnsdall Refineries, Inc.
Barrett Co., The
Bettis Sales Co. 85
Bethlehem Steel Co. 2
Bigelow-Liptak Corp.
Bignall & Keeler Machine Works
Black, Sivalls & Bryson, Inc.
Bradford Motor Works, Inc. 82
Brauer Machine & Supply Co.
Braun, C. F., & Co.
Brewster Co., Inc., The 33
Bridgeport Machine Co.
Bristol Co., The
Broderick & Bascom Rope Co.
Brown Instrument Co.
Buckeye Traction Ditcher Co.
Butler Mfg. Co. 63
Byers, A. M., Co.
Byron Jackson Co. Front Cover

C

Carey, Philip Co., The
Caterpillar Tractor Co.
Inside Front Cover
Chain Belt Co.
Chaplin-Fulton Mfg. Co., The 66
Chapman Valve Mfg. Co., The
Chicago Bridge & Iron Works
Clark Brothers
Classified Wants 76-77
Cleveland Trencher Co., The
Columbian Rope Co.
Columbian Steel Tank
Columbus Forge & Iron Co., The
Continental Supply Co., The
Cooper-Bessemer Corp., The 69
Corona Products, Inc.
Crane Co. 53

D

Darling Valve & Mfg. Co.
Dart, E. M., Mfg. Co.
Davey Compressor Co.
Davis Regulator Co. 91
Dearborn Chemical Co.
Diamond Rubber Co.
Dixon Crucible Co., Joseph
Dodge Brothers Corp.
Donovan Boiler Works, Inc. 39
Dresser, S. R., Mfg. Co. 21
Driftmeter, Inc.

E

Eagle-Picher Lead Co. 46
East Texas Refining Co.
Economy Pump & Tool Co., The
Edward Valve & Mfg. Co., The
Empire Oil & Refining Co.
Ethyl Gasoline Corp.
Exchange Banks of Tulsa

F

Falk Corp., The
Fenwick-Reddaway Mfg. Co.
Fisher Governor Co.
Foster Wheeler Corp. 36
Foxboro Co., Inc., The
Franklin Valveless Engine Co.
Frick-Reid Supply Corp.

G

Gardner-Denver Co.
Garlock Packing Co., The
Gaso Pump & Burner Mfg. Co.
Gates Rubber Co.
General American Tank Car Corp.
General Electric Co.
Globe Oil Tools Co.
Goodrich, B. F., Rubber Co., The
Goodyear Tire & Rubber Co.
Gott, H. P., Mfg. Co., Inc. 105
Goulds Pumps, Inc.
Granite City Steel Co.
Gray Processes Corp., The
Griscom-Russell Co., The 91
Guiberson Corp., The 87
Gulf Refining Co.

H

Halliburton Oil Well Cementing Co.
Harrisburg Pipe & Pipe Bending Co.
Hazard Wire Rope Co. 41
Hedges-Walsh-Weidner Co., The
Heeter, Sons & Co., Inc., C. M.
Hercules Motors Corp.
Hercules Supply Co.
Hercules Tool Co.
Heydrick Mapping Co. 105
Highland Iron & Steel Co., The
Hope Engineering Co.
Hough, Charles N., Mfg. Co., The
Hughes Tool Co. Back Cover
Humble Oil & Refining Co.

I

Industrial Dallas, Inc.
International Harvester Co. of America
International Nickel Co., Inc., The 4
International-Stacey Corp.
International Supply Co.

J

Jackson Co., Byron Front Cover
Jackson Engineering Corp.
Jarecki Mfg. Co.
Jenkins Bros.
Jerguson Gage & Valve Co.
Johns-Manville Corp.
Jones & Laughlin Steel Corp.

K

Kellogg, M. W., Co., The
Kennedy Valve Co., The
Kerotest Mfg. Co.
Key Boiler Equipment Co.
Kirk-Morrow Iron Works, Inc.

L

Landis Machine Co., Inc.
Layne & Bowler Co. 71
Leader Iron Works, Inc.
Leeds & Northrup Co.
Lemmons, Inc., Henry L.
Leonard Construction Co.
Lincoln Electric Co.
Linde Air Products Co. 3
Longyear, E. J., Co.
Ludlow Valve Mfg. Co.
Lufkin Foundry & Machine Co., The.
Lummus Co., The
Lunkenheimer Co., The 7

Mc

McAlear Mfg. Co., The
McClintic-Marshall Corp.
McCord Radiator & Mfg. Co.
McKee, Arthur G., & Co.

M

MacClatchie Mfg. Co.
Magnolia Petroleum Co.
Mair, D. S., Machinery Corp.
Maloney Tank Mfg. Co. 8
Marsh Gauge Pole Co. 104
Martin-Decker Corp.
Mathieson Alkali Works, Inc., The
Merco Nordstrom Valve Co.
Metric Metal Works 6
Mid-Continent Map Co.
Midwest Piping & Supply Co., Inc.
Mine Safety Appliance Co.
Moloney Electric Co. 105
Moon Mfg. Co., The
Moore, Lee C., & Co., Inc.
Moorlane Co., Inc.
Moser Manufacturing Co.
Munn & Co. 105

N

National Equipment Co.
National Lead Co.
National Supply Co. 27
National Tank Co.
National Transit Pump & Machine Co. 19
National Tube Co.
Naylor Pipe Co. 35
Neilan Co., Ltd.
North American Car Corp.

O

Oakite Products, Inc.
Ohio Injector Co., The
Oil and Gas Journal, The 64
Oil Conservation Engineering Co. 74
Oil Well Supply Co.
Oxweld Acetylene Co. 3

P

Page Fence Assn.
Paraffine Companies, Inc., The
Parkersburg Rig & Reel Co., The
Patterson-Ballagh Corp.
Penberthy Injector Co.
Petroleum Engineering, Inc.
Petroleum Equipment Co. 104
Petroleum Iron Works Co.
Pickering Governor Co., The
Pittsburgh-Des Moines Steel Co.
Pittsburgh Equitable Meter Co.
Pittsburgh Steel Products Co.
Plymouth Cordage Co.
Pomona Pump Co. 82
Powell, William, Co.
Power Mfg. Co., The
Power Piping Co.
Prescott Co., The
Prest-O-Lite Co., Inc., The 3
Public Service Co.
Pure Oil Co., The

R

Reading Iron Co.
Reading-Pratt & Cady Co., Inc.
Regan Forge & Engineering Co. 85
Reid, Joseph, Gas Engine Co.
Republic Steel Corp. 43
Republic Supply Co.
Robinson Orifice Fitting Co.
Roebling's, John A., Sons Co.
Ross-Meehan Foundries Co. 105

S

St. Louis Cordage Mills 70
Shaffer Tool Works
Sherwin-Williams Co.
Smith Bros. Construction Corp
Smith Separator Co.
Smooth-On Mfg. Co.
South Chester Tube Co.
Southwestern Construction Corp.
Spang, Chalfant & Co., Inc.
Sperry-Sun Well Surveying Co. 75
Stockham Pipe & Fittings Co.
Stoody Co.
Sullivan Machinery Co.
Sureshot Torpedo Co.

T

Tagliabue, C. J., Mfg. Co.
Taubman Supply Corp.
Taylor Forge & Pipe Works
Technical Products, Inc. 105
Texas Electric Service
Texas Steel Co.
Timken Roller Bearing Co., The 54
Titusville Iron Works Co.
Toledo Pipe Threading Machine Co. 83
Trackson Co.
Tretolite Co. 50
Trimont Mfg. Co.
Truman Smith Const. Co., The
Truscon Steel Co.
Tube Turns, Inc. 56-57

U

Union Carbide & Carbon Corp. 3
Union Wire Rope Co.
United Engineers & Constructors
United States Steel Corp.
Universal Oil Products Co. 23

V

Vacuum Oil Co., The
Vellumoid Co., The
Victaulic Co. of America
Vogt, Henry, Machine Co.

W

Wagner Electric Corp.
Wailes, Dove-Hermiston Corp.
Walworth Co. 1
Warren Petroleum Co.
Waukesha Motor Co.
Westco Pump Corp. 67
Westcott Valve Co.
Western Gas Construction Co., The
Westinghouse Electric & Mfg. Co., The
Wickwire Spencer Steel Co.
Williamsport Wire Rope Co.
Winkler-Koch Engineering Co., The
W. K. M. Co., Inc.
Worthington Pump & Machy. Corp. 5
Wright Manufacturing Co.
Wyatt Metal & Boiler Works

Y

Youngstown Sheet & Tube Co., The

The OIL and GAS JOURNAL

PRODUCING REFINING PIPELINE ENGINEERING MARKETING

VOL. 30. NO. 28 TULSA, OKLAHOMA, NOVEMBER 26, 1931

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Table of Contents

SPECIAL ARTICLES

Crude Oil Reserves Are Not Excessive 11
By Andrew M. Rowley
Recent gauges show big drop in potentials in Oklahoma. Estimates revised downward on recovery in East Texas.

East Texas Recovery Overestimated 13
By L. G. E. Bignell
Thickness of producing sand may not average more than 20 feet with ultimate yield 1,159,200,000 barrels.

Taking Natural Gas to Frontier Areas 14
By L. E. Bredberg
Pipe line being constructed to towns near Mexican border from Pecos valley field.

Oklahoma to Illinois Pipe Line Rumored 15
Standard of New York and Vacuum set-up makes oil men feel extension of Magnolia's system to East is logical.

Octane Number of Gasoline Higher 16
By A. J. Kraemer, E. L. Gartin, E. C. Lane, N. R. White and H. K. Cummings
Latest government survey shows improvement in anti-knock value.

Combine Topping and Cracking in East Texas Operation 17
By C. O. Willson

A.P.I. Refinery Report 18

Heating Value as Basis for Gas Sales 18
By Roy O. Neal
Wide variation in calorific value of gases obtained from several fields important to industrial users.

Ruthless Competition (Editorial) 20

New Laboratory Houses Unique Development and Research Equipment 22
By A. E. Mockler

Supreme Court Sustains Gas Order 24
Bandini Company loses case challenging validity of California gas conservation law. Lower court upheld.

Pipe Line Construction News 28

Volumetric Efficiency in Pumping 29
By Harlan N. Marsh
Methods for estimating actual plunger stroke with formulas and tables.

Field Problems and Their Solution 58
Edited by Thomas F. Smiley

Oil Men Before Journal's Cameras 62

FIELD OPERATIONS

Late Fields 24

East Texas 25
By L. E. Bredberg

West Texas, North Texas and Panhandle 26
By L. E. Bredberg

Oklahoma 34
By W. A. Spinney

Kansas 37
By W. A. Spinney

North Louisiana-Arkansas 38
By J. R. Crumpton

Gulf Coast 40
By Neil Williams

Southwest Texas 42
By B. D. Stevenson

Rock Mountain Area 44
By Tolbert R. Ingram

Canada 44
By Victor Lauriston

Eastern Fields 45
By Staff Correspondent

California 47
By L. P. Stockman

Central West and Kentucky 49
By George A. Whitney

Tioga Gas Field 100

REFINING AND MARKETING

Burning Oils Strong in Oklahoma 12
By C. O. Willson
Buying absorbs available material. Refinery gasoline and natural gasoline prices lower.

Technical Questions Answered 61
By C. K. Francis, Ph.D.

Prepare for Higher Octane Ratings 78
By Robert C. Conine
Refiners certain it will be necessary to improve regular grade.

East Coast to Get Rumanian Gasoline 79
By A. E. Mockler
Cargo scheduled for shipment from Constanza this month.

Brief Items for Petroleum Refiners 89

Natural Gasoline Manufacture 90

Refinery and Crude Prices 92-93

Tank Wagon Quotations 94

Of Interest to Sales Departments 95

DEPARTMENTS OF GENERAL INTEREST

The Advertisers' Index 9

Personal Paragraphs About Oil Men 51

Natural Gas Developments 52

Oil Industry Equipment and Supplies 55

Classified Want Advertisements 76-77

Oil Securities Market 96-97

Detailed Field Operations for October 106

Crude Petroleum Statistics 112

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Refinery Section Starts on Page 78

Crude Oil Reserves Are Not Excessive

Highest production in 1930, week ending Feb. 22, average daily output 2,699,096 bbls. Peak of U. S. production, week ending Aug. 24, 1929, average 2,975,435 bbls.

Gauges Show Large Drop in Potentials in Oklahoma. Estimates Revised Downward on East Texas Recovery

By Andrew M. Rowley

Lowest daily average crude oil production in the United States during 1930 was for week ending Dec. 27 with average output of 2,144,074 bbls.

Investigations conducted recently in the various prolific producing oil fields give additional proof that recent advances in crude oil prices were entirely justified. They also indicate that a continuation of the trend now being observed undoubtedly will lead to further increases in prices.

Gauges taken in the Oklahoma City Field on 545 wells out of a total of 845 producing show a decline in potential, averaging 14.3 per cent in six months, while wells in the West Asher Pool of the Greater Seminole area of Oklahoma show a drop in potential to 8,000 bbls. from the 29,000-bbl. potential recorded six months ago. Engineers and production men are revising downward their early estimates of ultimate recovery from the East Texas fields, the latest conservative estimate giving that area an average recovery of only 12,600 bbls. per acre. Many production men in close touch with conditions in East Texas feel that figure is too high.

Oil men in Texas are confident prices for East Texas crude will be advanced again in the near future. Such action undoubtedly would be reflected in increases in other sections of the Mid-Continent area. Announcement of higher prices in California have been expected since the middle of this month. A problem in regard to excess gasoline stocks is thought to have delayed the increase in prices.

A factor of paramount importance is the necessity of continued curtailment of runs to refineries. Gasoline prices influence to a very great extent the crude oil price schedules.

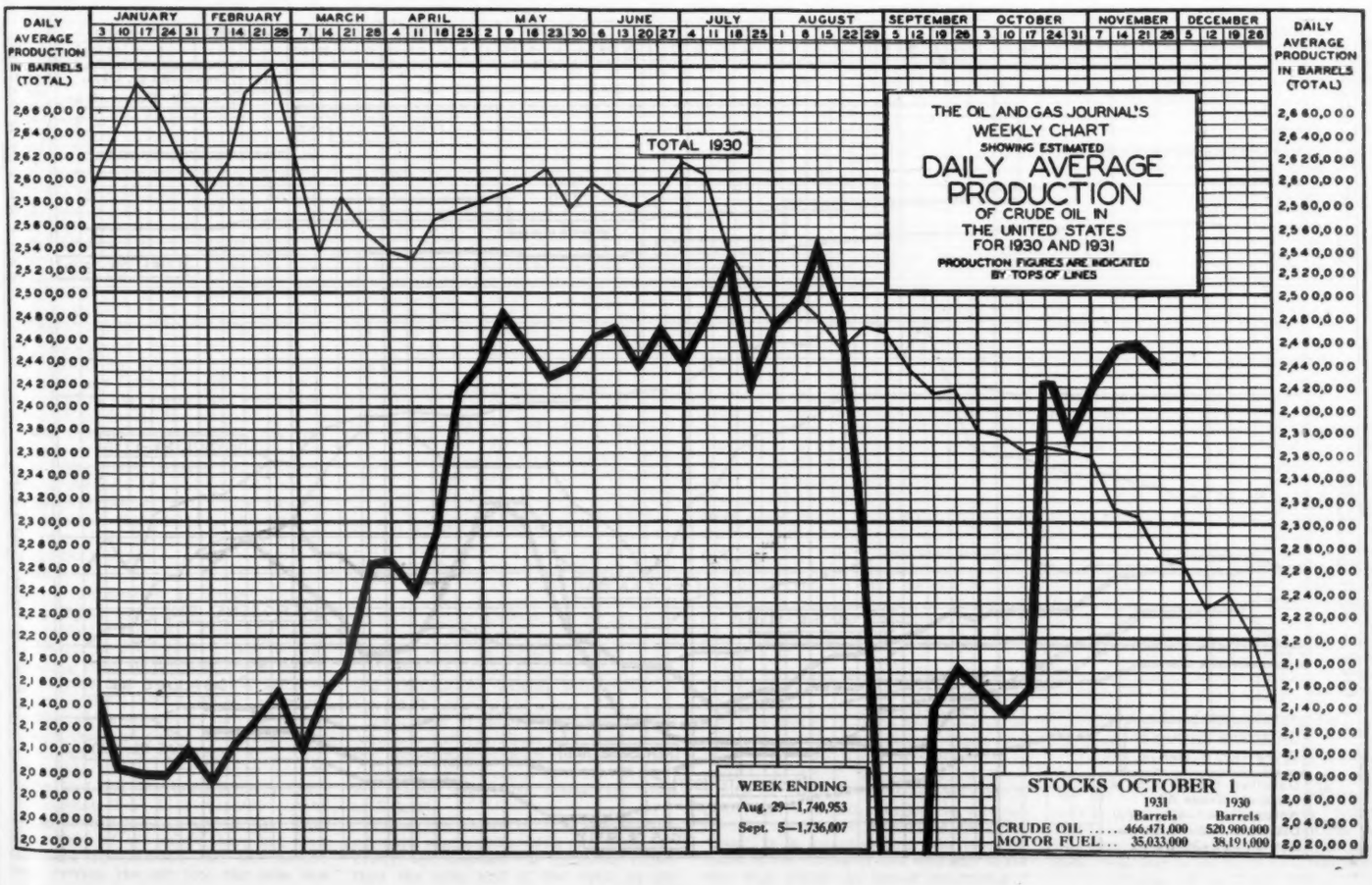
While there is a general tendency upon the part of many oil men to deprecate any talk of greater drilling activity, the fact remains those companies which have made a study of present conditions and the probable ultimate recovery from present fields are quietly arranging to procure promising acreage and test likely looking areas. Present reserves are far from excessive and far-sighted companies are looking to the future and planning to protect their own interests by developing their own reserves for future requirements.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of crude oil in the United States for week ended November 21, and a comparison with the previous week, follows:

	Nov. 21	Nov. 14
Oklahoma—		
Oklahoma City	192,210	169,235
Seminole-St. Louis	156,985	139,610
Remainder of State	209,120	234,440
Total Oklahoma	558,315	543,285
East Texas—		
Kilgore	127,584	140,082
Lathrop	116,942	132,068
Joiner	126,685	139,115
Total East Texas	371,211	411,265
West Texas	202,434	202,178
North Central Texas	83,129	84,240
Texas Panhandle	62,484	60,488
East Central Texas	56,845	56,426
North Louisiana	29,570	29,615
Arkansas	37,750	37,045
Kansas	104,410	102,710
Total Mid-Continent area	1,506,148	1,527,952
Gulf Coast—Texas	120,056	119,985
Gulf Coast—Louisiana	32,425	32,320
Southwest Texas	64,985	61,755
Eastern	120,000	120,000
Rocky Mountain area	95,379	93,968
California—		
Santa Fe Springs	62,500	62,750
Long Beach	74,750	75,250
Playa Del Rey	22,550	21,750
Elwood	23,500	23,850
Kettleman Hills	58,000	62,300
Remainder of State	262,700	260,250
Total California	504,000	506,150
Total United States	2,442,993	2,462,130

→ **Decrease, 19,137 Bbls. Daily** ←



Burning Oils Are Strong in Oklahoma

Buying Absorbs Available Material. Refinery Gasoline and Natural Gasoline Prices Lower With Slower Demand

By C. O. Willson

Burning oils and all low cold test oils used as fuels with the exception of the low gravity industrial grades were the strongest products in the Oklahoma (Group 3) market during the past week. Substantial purchases by both domestic and export buyers placed with Mid-Continent refiners, have absorbed all the low priced kerosene available and the market was strong the first of the week. In the case of oils used as fuels, especially furnace oil material, the limited offerings by refiners continue to be absorbed by buyers with the expectation that a period of low temperatures in the northern states, will result in general price advances.

The situation in regard to refinery gasolines and natural gasolines is not so favorable. The reactionary trend which was apparent the middle of the month has spread and the first of the week there were indications that it might develop into a rout and the sellers lose a large part of the price recovery obtained during October and early November. In the case of refinery gasolines, increased offerings on the part of a number of small refiners were in excess of the buying relief obtainable from a small group of larger refiners and distress material was making its appearance at several points. A majority of the sellers were continuing to quote a low of 4¼ cents for the U. S. Motor grade but scattered sales were reported from one-eighth to three-eighths cent under this price. Unless buying improves these distress sales will become the going market within a few days. In the case of natural gasoline there has been little new business since the middle of the month. While there has been little evidence of distress on the part of the manufacturers, sellers have not hesitated to take lower prices in the few spot sales being made and prices are approximately one-half cent under the going market of a week ago.

REFINED MARKET BAROMETER

Refinery gasoline prices weakened in the Mid-Continent and Middle West during the week but at coastal points export and domestic prices continued firm. Reports from all parts of the United States and Canada indicated a seasonal slowing up in gasoline demand. Natural gasoline prices also slumped in the Mid-Continent but advanced in California where the demand recently has exceeded the supply. Kerosenes generally firm with an improved domestic and export demand. Furnace oils and other special fuels are reflecting a seasonal increase in demand. Heavy fuels were generally unchanged. The few changes reported in all classes were generally downward. Wax prices unchanged.

Mid-Continent—Refinery gasoline and natural gasoline prices lower due to slower demand. Kerosene and all low cold test grades of furnace oils strong. Fair demand for heavy fuels. Lubricants slow.

East Coast—Gasoline tank car prices firm with scattered advances in tank wagon schedules. Better demand for kerosene. Bunker fuel oil unchanged. Industrial consumption of gas oil improves. Little activity in lubricants.

Chicago—Gasoline prices reduced as more material offered from Mid-Continent points. Cold weather reduces consumption. Kerosene firm. Fuel oils unchanged.

Pennsylvania—Gasoline and kerosene firm. Scattered reductions in bright stocks and neutral oils. Wax unchanged.

Gulf Coast—Easier tone in pale and red neutral markets. Furnace oil demand active. No change in fuels.

California—Natural gasoline prices advance. No change in other products.

Need Reduced Runs

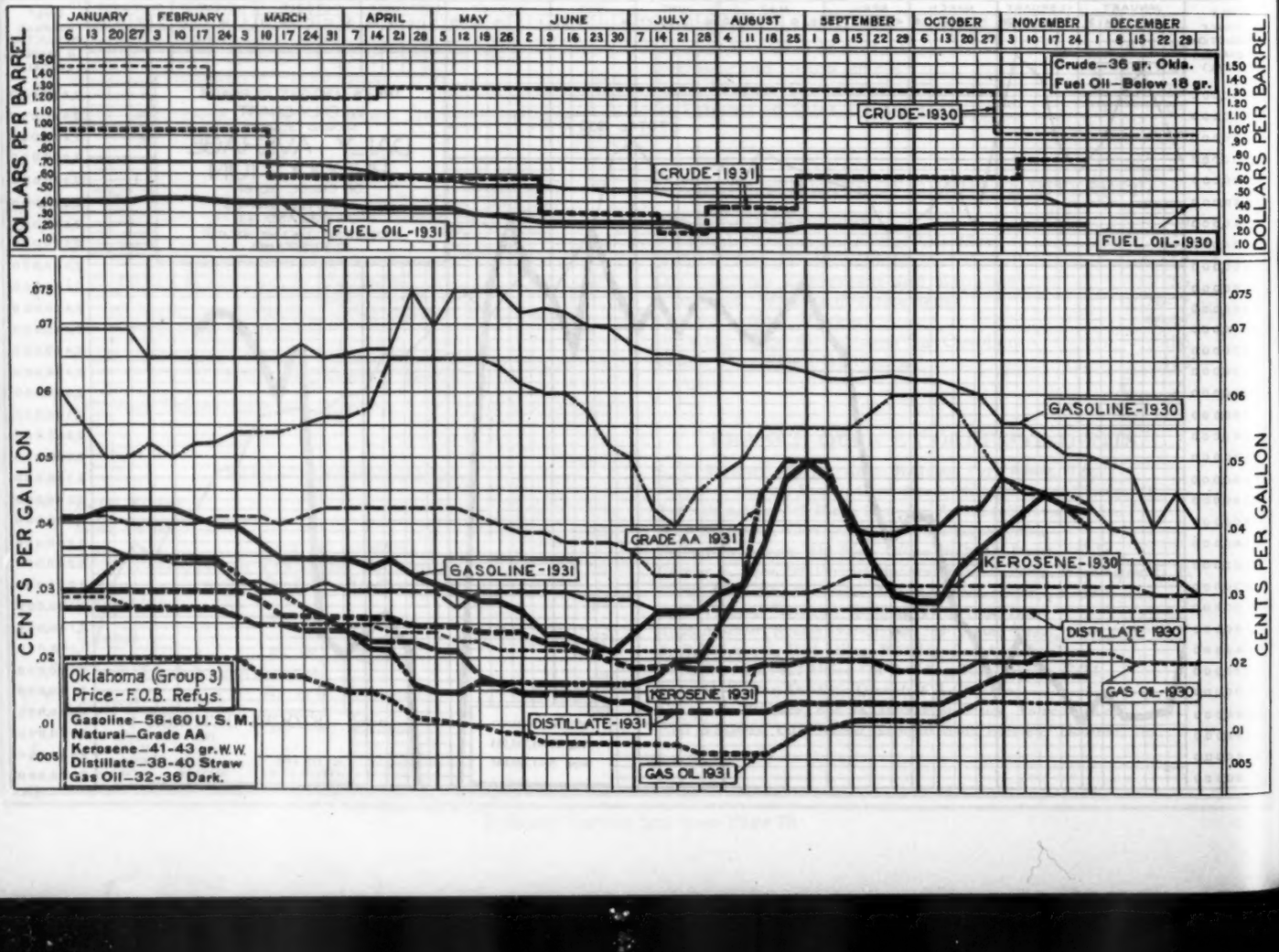
Developments in the refinery gasoline market, point unmistakably to the need of reduced crude oil runs to stills with a corresponding reduction in gasoline output in the Mid-Continent and competitive refining groups if a healthy market situation is to be maintained during the winter months of low gasoline consumption. The strength shown in the gasoline market during October and the first half of November was largely due to a combination of a gasoline consumption which did not show the usual seasonal decline and a willingness on the part of several major refiners in the Mid-Continent to curtail their own refinery operations and purchase excess supplies of smaller operators. The arrival of cold and stormy weather throughout the Middle West has brought the seasonal decline in actual consumption and the load of absorbing excess material has become too great for the refiners who have been supporting the market with steady purchases.

The recent buying of these companies apparently was misinterpreted by many of the sellers. The purchases were made in the hope that by thus furnishing temporary relief, the market would be relieved of distress material and the sellers given an opportunity to adjust their plant operations so their gasoline output could be brought in line with the ready demand with due allowable made for the seasonal decline in consumption. The quantity of this gasoline, however, has increased rather than decreased and unless major refiners outside the Mid-Continent are willing to make large purchases the liquidation of this gasoline will have to take place at lower prices through regular trade channels.

Inter-refinery Buying

The intercompany purchase of gasoline to relieve distress conditions has objectionable features from several angles on the part of buyers. In the first place any purchases mean a corresponding decline in the plant output of the buying company. These companies invariably have sufficient plant capacity and plenty of crude oil to take care of their own requirements and using their own facilities they are able to reduce their overall operating costs. In general, they have been paying more for the outside gasoline than their own cost of manufacture. In the second place, the refiners have difficulty in purchasing gasoline which corresponds in quality to the gasoline refined at their own plants. This angle

(Continued on Page 103)



East Texas Recovery Overestimated

Thickness of Producing Sand May Not Average More Than 20 Feet With Ultimate Yield Estimated at 1,159,200,000 Bbls.

By L. G. E. Bignell
Petroleum Engineering Editor

As the development of the great East Texas oil field progresses, geologists, production men, petroleum engineers and others actively engaged in work there are gradually gaining a more detailed knowledge of conditions that will influence the recovery of oil and gas. It now seems to be the concensus of opinion of those best qualified to know about such matters that, while the field as a whole has intercommunicating sand bodies over the entire area, it will be necessary to make detailed studies of individual wells and leases if the best results are to be obtained.

During the period of enforced shutdown under military orders it was found that there was an increase of pressure in low pressure areas which would lead to the assumption that adjacent high pressure areas had lost at least a portion of their pressure during the equalizing process. It is reported that in some areas this increase in pressure was as high as 9 pounds per day per well or during the period of shutdown of about 20 days the total increase amounted to approximately 180 pounds.

As pointed out in an article by Harold Vance published in The Oil and Gas Journal of October 22 there are many low pressure areas in the East Texas Field and this has been confirmed by later observations which indicate that the zone of low pressure has moved from the east toward the west and this movement is still in progress. This seems to confirm the theory of intercommunicating porous formations in this field and from these data it may be reasoned that in time it is quite probable that the eastern portion of the field will experience a decided drop in bottom hole pressures.

It has been reported that a column of oil and gas in the East Texas Pool will weigh approximately .34 pound per foot of height. Taking an average depth of wells as 3,650 feet it would then follow that the total weight of this column of oil and gas would be about 1,250 pounds. Therefore when the average bottom hole pressure in the wells falls below 1,250 pounds per square inch it is only logical to assume that the wells will no longer flow naturally and it will be necessary to resort to mechanical means of producing the oil.

Data recently compiled show that the area where the bottom hole pressures are below 1,300 pounds extends along the east edge of the field from the Henderson to the Kilgore districts and quite recently it is reported that wells on the extreme east edge of the Lathrop Pool have been put on the pump due to low bottom hole pressure.

Production by Zones

A study of the general geology of the area indicates that this field may be divided into three zones from east to west extending from the extreme south end of the field to the north edge of Lathrop district. These zones would represent areas in which the energy moving the oil through the sand would be derived from gas, gas and water and water.

A study of the stratigraphy of the Eagle Ford and Woodbine formations indicates that there is a thinning out of section toward the east and in that thinner portion of the sands there has been no water encountered and the motive force driving the oil into the hole has been derived from the gas entrapped in the oil and a slight gravity head between well and oil level in the sand. It is in this zone that the minus 1,300-pound bottom hole pressures now exist.

To the west of this zone of gas energy the producing formations tend to thicken and the Woodbine sand encountered beneath the Eagle Ford sand is saturated with water which has been encountered where wells have been drilled too deep. This bottom water, that is water lying in the Woodbine sand directly below the oil-bearing Eagle Ford horizon, tends to move upward as the oil and gas is withdrawn. In this middle zone the force moving the oil to the well is a combination of entrapped gas and water flooding.

The third zone lies along the western edge of the field and there the water has been encountered in both the Eagle Ford and Woodbine formations and it is assumed that the greater part of the propulsive force moving the oil is coming from the water movement. The entrapped gas is playing some part in the recovery of oil but for the sake of classification it is assumed that this extreme western zone is primarily deriving its energy from the hydrostatic head of water lying adjacent to it on the west and beneath the Eagle Ford formation in the Woodbine sand.

With this general idea in mind it seems logical to predict that wells located along the eastern edge of the field where the gas energy and gravity are the motive forces propelling the oil to the well there will be a more rapid depletion of bottom hole pressure than in the middle and western zone where oil is being replaced by the incoming flood of water.

This theory is being borne out by study of bottom hole pressures and, as stated above, maps of the East Texas fields show position of contour lines marking areas of minus 1,300-pound bottom hole pressure and indicate movement toward the west with no marked change in the contour lines of the areas of 1,400, 1,500 and 1,600-pound bottom hole pressures toward the east.

This zone of minus 1,300-pound pressure now extends about half way across the Joiner district with narrower bands extending to the south into the Henderson district and north beyond the town of Kilgore.

There are places in this area of low pressure where some wells still flow naturally, but they are the exception rather than the rule, and of the wells on the pump it is reported that very few of them have been able to make as much as 100 bbls. of oil per day even though the allowable has been above that figure for some time.

Within each of the three zones described above there are many variations of sand conditions which may be illustrated by considering two wells in the same general area which under like producing conditions have made, in one case over 145,000 bbls. of oil from about 2 feet of sand, while in the other well, with from 15 to 20 feet of apparently good sand, but a small proportion of that amount of oil has been recovered.

Stratigraphy of Deposits Irregular

The practice of coring the formation immediately after the cap rock has been penetrated is quite generally followed in all parts of the field and study of the cores secured reveals many very interesting details. It has been quite generally reported from wells in all parts of the field that there were missing sections of the core representing formations that could not be recovered, and it has been quite generally assumed that these missing sections represented a brown sugar sand that was well saturated with oil.

On this basis producing sand thickness has been calculated but later actual production rates do not seem to bear out this theory for just prior to the military shutdown when all wells were produced to their extreme limit until all tankage available was filled the total production of oil for the last day preceding shutdown was about 1,200,000 bbls. or at the average rate of about 700 bbls. per well from about 1,700 wells. This does not mean that more oil would not have been produced per well if facilities for handling it had been available but it does give some criterion that the general well capacity is far below tens of thousands of barrels per day which has so often been assumed as a fact for the East Texas Pool.

The fact that many wells have been overrated and productive sand in great thickness has not been penetrated is further discounted if the actual process of coring is considered in detail. When coring a sand with rotary core barrel it is possible to detect, on the derrick floor, a ring in the drill stem as the sand is penetrated and this ringing is not noticeable when other formations are being cored. It is reported that one observer followed the coring of one well and heard this ring which the barrel penetrated 3 feet of formation in taking a 6-foot core. When the barrel was withdrawn and examined it was found that 3 feet of sand had been recovered and the balance of the barrel was perfectly clean.

The driller assumed that the missing section was brown sugar sand and so reported it. A second 6-foot core was then taken and the observer again noted the ring in the drill stem while 1 foot of formation was penetrated and this checked when the barrel was withdrawn and examined for it was found that only 1 foot of sand had been recovered and again the balance of the barrel was clean. The driller reported the missing section as brown sugar sand, or for a total core of 12 feet he reported 12 feet of producing formation.

It is a well known fact that in the East Texas Field there are streaks of soft shales, muds, and volcanic ash between sand members and if it is assumed that the wash water would mix with this type of material and it would be brought out in the returns it would follow that instead of coring brown sugar sand the missing formation is actually a nonproductive material. Experience in other fields has shown that when a sand is penetrated, no matter how soft it may be, there is always some evidence of it in the core barrel. Therefore it seems strange that in East Texas no evidence has ever been secured of the brown sugar sand in the core barrels and as the returns have not generally been checked while the coring has been going on it is not positively known whether this missing section is sand or mud, but if it were saturated oil sand it should show up in the slush pit.

If the above line of reasoning holds it will mean that the amount of producing sand in East Texas wells will be much less than at first estimated and instead of an average producing sand thickness of 30 feet, later figures place the thickness at about 20 feet, which seems much more nearly correct when the actual performance of the wells is taken into consideration.

Estimated Production

With the above conditions in mind the probable amount of oil to be recovered from the East Texas Field may be based upon a productive sand thickness of 20 feet and a porosity of 20 per cent with a 90 per cent saturation. With an estimated recovery of 45 per cent of the oil in the formation and based upon 92,000 productive acres in the entire field it is found that the total yield for East Texas oil field will be about 1,159,200,000 bbls., or at the rate of 12,600 bbls. per acre.

If this oil is withdrawn at the rate of 500,000 bbls. per day it would require about six years to secure it. The immediate question is: "Will they restrict rate of flow to not exceed 500,000 bbls. if the demand for oil should increase in the future?"

This basis of 500,000 bbls. per day has been arrived at more by estimating the possible rate of production from this field rather than upon any external causes such as demand for oil, restriction by orders from Railway Commission or increased price. If the field is completed with an average of one well to each 20 acres there will be less than 5,000 wells drilled in the 92,000 acres that comprises the productive portion of the area.

It has been found that wells that have reduced their bottom hole pressures below the flowing pressure will produce at varying rates but always with rather rapid declines. There are exceptions to this statement where some wells can produce from 500 to as much as 1,000 bbls.

(Continued on Page 101)

HIGH SPOTS ABOUT EAST TEXAS OIL FIELDS

That the early estimates of total ultimate recovery from the East Texas fields seem to have been overly optimistic is indicated by later studies of conditions in the field, according to the investigation conducted by Mr. Bignell and explained in the accompanying article. Points brought out in this article include:

Bottom hole pressures along the eastern edge of the field are not sufficient to flow the wells.

This area of low bottom hole pressures is moving from east to west.

Thickness of the producing sand is less than early estimates indicated it to be and will probably average not more than 20 feet.

Based on a sand thickness of 20 feet, a porosity of 20 per cent and a 90 per cent saturation, with 45 per cent recovery from the 92,000 productive acres, the total yield from the East Texas area probably will be 1,159,200,000 bbls., or at the rate of 12,600 bbls. per acre.

The cost of procuring this oil has been estimated at between $579,600,000 and $753,480,000.

Taking Natural Gas to Frontier Areas

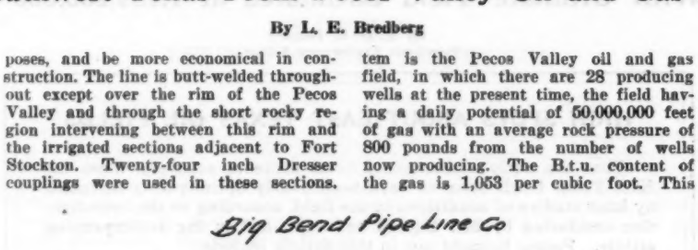
Pipe Line Being Constructed to Towns Near Mexican Border in Southwest Texas From Pecos Valley Oil and Gas Field

By L. E. Bredberg

The Big Bend Pipe Line Co., which was organized for the sole purpose of constructing a gas line from the Pecos Valley Pool, northern Pecos County, to Fort Stockton, Alpine and Marfa, has completed the first unit of this 104-mile system, and is going ahead with the more strenuous part of the job, laying the line through the rugged Davis Mountains between Alpine and Marfa.

This line is the result of several years' consideration of the proposition by Col. Albert T. Woods of Artesia, N. Mex., and his associates, W. F. Ritter and A. J. Inderreiden of El Paso. During the summer of 1930 franchises were granted by the towns of Fort Stockton, Alpine and Marfa to Albert T. Woods as trustee, and during the spring of 1931 the Big Bend Pipe Line Co. was organized, as was also the Fort Stockton Gas Co., which handles the work of supplying this town with gas for domestic purposes. The officers and directors of the two companies are: M. P. Walker of Douglas, Ariz., president; A. J. Inderreiden of El Paso and Albert T. Woods, vice presidents; and W. F. Ritter, secretary-treasurer. The Big Bend Pipe Line Co. will construct and operate the transmission line from the gas field, and deliver gas at the city gates to the local distribution companies in the above mentioned towns. The company and associated companies form an independent unit, and are in no manner connected with other gas companies.

Owing to the length of the line, in comparison with the small population served, a 4-inch I.D. high pressure transmission line was considered as sufficient to serve the company's and towns' purposes, and be more economical in construction. The line is butt-welded throughout except over the rim of the Pecos Valley and through the short rocky region intervening between this rim and the irrigated sections adjacent to Fort Stockton. Twenty-four inch Dresser couplings were used in these sections.



Oxy-acetylene was used for welding.

The design of the system calls for the delivery of the gas into the transmission line at the natural rock pressure of 400 pounds to the square inch. Under these conditions it is believed that compressor stations will not be required for a number of years.

Source of Supply

The source of supply for the gas system is the Pecos Valley oil and gas field, in which there are 28 producing wells at the present time, the field having a daily potential of 50,000,000 feet of gas with an average rock pressure of 800 pounds from the number of wells now producing. The B.t.u. content of the gas is 1,053 per cubic foot. This field is the only one west of the Pecos River which has produced sweet gas. It is also dry and of .605 gravity, containing no other objectionable ingredients. Surface elevation of the field is 2,700 feet and the elevation of Alpine and Marfa is 4,500 feet above sea level, showing the comparison of the two areas in altitude, and how it will tend to decrease pressures at Alpine and Marfa. Pressure is 300 pounds per square foot at Fort Stockton and is stepped down through standard regulator set-up, but distance and altitude will cut the pressure down to an estimated 80 pounds at Alpine and 45 or 50 pounds at Marfa. A standard regulator meter station has been erected at the wells and at the Fort Stockton border station. Such stations also will be erected at Alpine and Marfa.

H. L. Gentry, gas engineer, made a survey and study of the proposed line and system and also of the potential gas supply of the Pecos Valley Field before plans were finally consummated for building the system. Prior to the staking of the line an aerial survey was made of the proposed route from the Pecos Valley Field, via Fort Stockton to Alpine, thence to Marfa. Since it was necessary to photograph the terrain from an atitude of 14,000 feet above the surface the plane was forced to an altitude of around 20,000 feet over that portion of the line that crosses the Davis Mountains. This aerial photographing of the terrain and proposed route added materially in effecting a saving of time and money in "tying in" by the ground surveying party.

Blasting Necessary

The portion of the completed transmission system from the gas field to Fort Stockton extends in almost a straight line, rim rock and alluvial soil being traversed in this short stretch, but soil of such a nature that corrosive re-

(Continued on Page 84)

Another aerial view of a pass through the Davis Mountains.

Aerial view of the rugged Davis Mountains and Hell's Canyon the pass through which the line will be laid on the route between Alpine and Marfa. Aerial photography in surveying for a pipe line often proves of inestimable value, especially in such country as this.

Oklahoma to Illinois Pipe Line Rumored

Standard of New York and Vacuum Set-up Makes Oil Men Feel Extension of Magnolia's System to East Is Logical

Reports that a 10-inch crude oil pipe line would be constructed from Oklahoma to Wood River, Ill., gained wide circulation during the past week. It is also rumored the Texas-Empire Pipe Line Co. contemplates laying a line from East Texas to connect with its system at Lima, in the Seminole area of Oklahoma, giving that company a line from East Texas to Chicago.

Officials of the Ajax Pipe Line Co., which now operates a twin 10-inch pipe line system from Glenn Pool, near Tulsa, to Wood River, state they have no knowledge of plans to put another 10-inch loop in their line. An official of the Magnolia Pipe Line Co. also denies his company plans to construct a line from its system in Oklahoma to Wood River or points farther east.

The Ajax Pipe Line Co.'s two 10-inch lines have a capacity of 65,000 bbls. per day and that system has been delivering to the Illinois Pipe Line Co. at Wood River an average of between 55,000 and 61,000 bbls. daily. The Illinois Pipe Line Co. carries this crude to the north and east and delivers it to other eastern pipe line companies such as the Buckeye, Tide Water, Indiana, Imperial and others. The Illinois Pipe Line Co. has increased the capacity of its system out of Wood River and has handled as much as 65,000 bbls. daily from the Ajax.

Report 700-Mile Project

Reports from Pittsburgh, Pa., state the contemplated pipe line project calls for 700 miles of 10-inch pipe. If the Ajax looped its line to Wood River not much more than 400 miles would be required for that work. The other 300 miles might be desired for additional loops east of Wood River.

The Magnolia Pipe Line Co.'s system extends from Beaumont and Port Arthur, Tex., northwest through central Texas and on through Oklahoma up to the Burbank Field in the northern part of Oklahoma. This company has two trunk lines out of East Texas, one connected with its Arkansas-Beaumont line and the other at Corsicana with the main trunk system. It also has lines from West Texas and from the Texas Panhandle, all feeding into the main trunk system at Corsicana, Tex.

Being a subsidiary of the Standard Oil Co. of New York, which is part of the Socony-Vacuum Corp., many oil men feel it is logical the company should plan for a pipe line to eastern points to supply refineries of the Standard of New York and Vacuum east of the Mississippi.

Socony-Vacuum Requirements

It has also been pointed out that subsidiaries of the Socony-Vacuum Corp. are possible users of any pipe line system which makes Mid-Continent crude oil available to refineries located in the Middle West. One subsidiary, the Lubrite Refining Corp., has a 4,500-bbl. refinery located at East St. Louis. Another subsidiary, the White Star Refining Co., has a 5,500-bbl. plant at Wood River, Ill., and a 6,500-bbl. plant at Detroit, Mich. A third subsidiary, the Bartles-Maguire Oil Co. (Wadhams Oil Co.), has a 5,000-bbl. refinery at East Chicago, Ind. The Socony-Vacuum interests at present do not have any pipe line systems extending from the Mid-Continent to these refineries. As the combined interests expand their marketing facilities in the middle western states additional refining capacity will be required. The Standard Oil Co. of New York has a 5,000-bbl. refinery at Buffalo, N. Y., while the Vacuum has a 6,500-bbl. plant at Olean, N. Y.

Present users of Mid-Continent crude oil transported via the Ajax and Illinois pipe lines include several refineries located in Ohio and adjoining states. There are also a number of plants which could readily be connected to the pipe line system.

The Standard Oil Co. of Ohio is the largest user of the line. In Ohio the Standard company has a refinery with a crude oil capacity of 20,000 bbls. at Cleveland and a 12,000-bbl. plant at Toledo. The company is also remodeling the recently acquired refinery of the Solar Refining Co. located at Lima. This refinery has a capacity of 18,000 bbls. daily. In the past the Lima refinery has operated largely with crude oil secured from middle eastern fields and it is understood that the Standard expects to continue this policy. At Latonia, Ky., the Ohio Standard has an 8,000-bbl. refinery operated by the Latonia Refining Corp., a 100 per cent subsidiary.

The Heath, Ohio, refinery of the Pure Oil Co., with a capacity of 11,000 bbls. daily and its 8,000-bbl. plant at Toledo, Ohio, are both users of Mid-Continent crude oil transported in the Ajax and Illinois pipe line systems. In Ontario, across the Canadian border from Michigan, the Imperial Oil, Ltd., has a refinery at Sarnia with a crude oil capacity of 22,000 bbls. daily. This is connected to the Ajax-Illinois pipe line system through the Buckeye Pipe Line Co. Another plant connected to the system is that of Lincoln Oil Refining Co. (Ohio Oil Co.) located at Robinson, Ill. This plant has a capacity of 10,000 bbls. daily. This plant is operated largely with middle western crude oil.

Magnolia Extension Logical

Oil men feel a logical step in the expansion program of the Socony-Vacuum Corp. is the construction of a pipe line from the Mid-Continent to eastern points to connect with lines in that area serving the company's refineries. As stated above, it is believed this company, a merger of the Standard Oil Co. of New York and the Vacuum Oil Co., will extend its marketing facilities through the Middle West and probably increase its refinery holdings. Under such a program a pipe line from the Mid-Continent to Wood River, Ill., or some point farther east would seem logical. Such a connection might be extended to Buffalo, N. Y.

Construction by the Magnolia Pipe Line Co. of a line from Oklahoma into Illinois would make available to eastern refineries, through such a line, crude oil from all the principal fields in Oklahoma, Arkansas and Texas. East Texas crude could be shipped to the main trunk line at Corsicana, Tex., and then transported north and east while Burbank crude, with a high lubricating value, which has been in demand by the Vacuum, would be available as the Magnolia's present system extends to Burbank in Oklahoma. The company's lines into West Texas and the Texas Panhandle would make crude from these areas available also.

PROMPT SHIPMENT ASKED FOR LYCOMING GAS LINE

By B. E. V. Luty

PITTSBURGH, Pa., Nov. 23.—Lycoming Natural Gas Co. has called for prompt shipment on an order reported last July, 110 miles of 20-inch seamless placed with National Tube Co. This is to be laid in New York state from the newly developed Tioga County natural gas field in north central Pennsylvania to Syracuse, N. Y. Laying will be expedited to avoid bad weather. A new oil line to be built from Oklahoma to Wood River, Ill., supposedly by a Standard Oil subsidiary, has come to the front but it is not known whether pipe will be bought at once. There is involved as the main line 700 miles of 10-inch, somewhat over 50,000 tons.

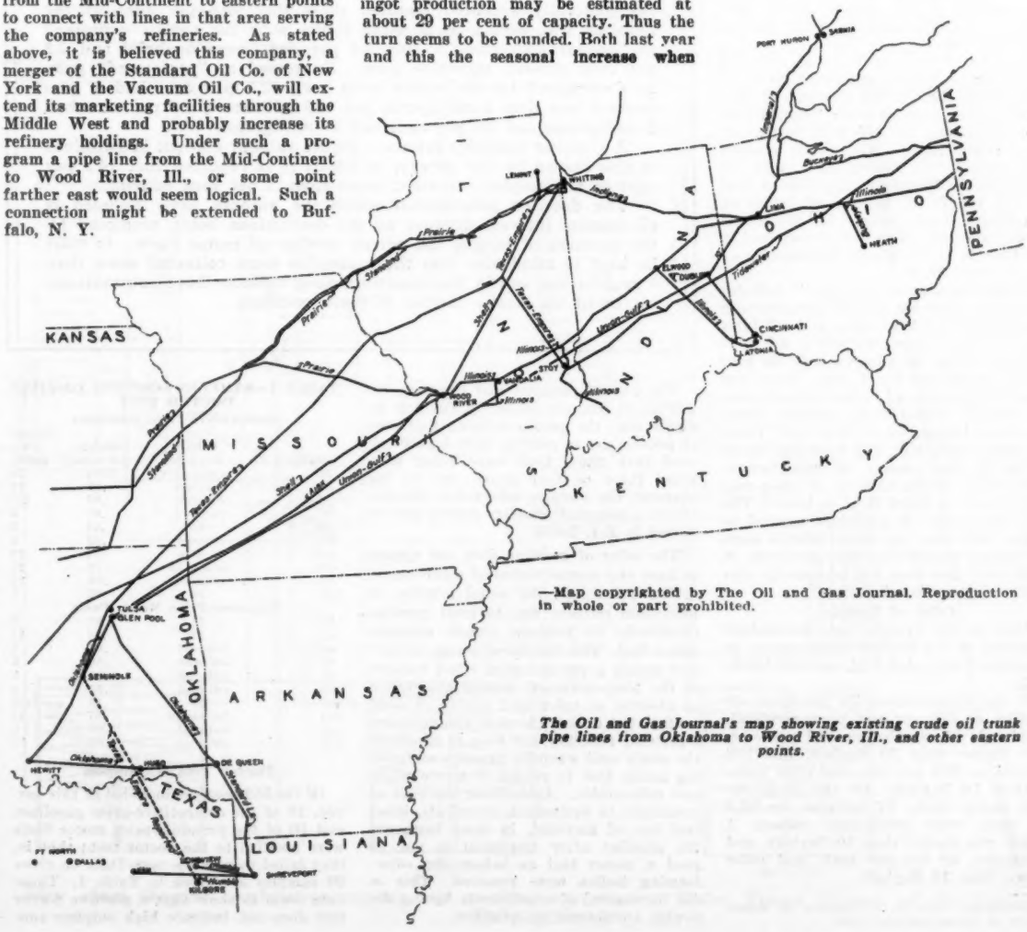
Demand for oil country goods generally has been running approximately the same for weeks.

For the third consecutive week steel ingot production may be estimated at about 29 per cent of capacity. Thus the turn seems to be rounded. Both last year and this the seasonal increase when measured in percentage was much greater than in continuously active times.

These percentages are misleading as an index of steel demand in general as they are computed against capacity and capacity has greatly increased. There has never been a steel demand closely approaching present capacity. Even the record year 1929 showed a production only 82 per cent of the capacity now used as basis for the percentage rates of operation so widely quoted.

Relating demand to actual demand of the past, not capacity, makes quite a different showing. A trend line computed by taking actual production in the nine years 1922 to 1930 inclusive, six of those years having been particularly good years, has a moderate upward slope and prolonged to this year would indicate production of about 50,000,000 tons, about three-fourths of present capacity. On this basis, the highest month of this year, March, comes out at close to 72 per cent instead of the 54.20 per cent actually reported, while the smallest month, October, comes out at nearly 37 per cent instead of 27.76 per cent as reported. From this computation it appears that steel demand has not been nearly as poor as might be supposed.

Finished steel prices remain very steady all along the line, indeed rigid, and prices are giving producers little concern, there being no fear of decline and not much disposition to try to get higher prices. While losses are being shown, that is chiefly on account of tonnage being so light as to make a poor distribution of running expenses.



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The Oil and Gas Journal's map showing existing crude oil trunk pipe lines from Oklahoma to Wood River, Ill., and other eastern points.

Octane Number of Gasoline Higher

Latest Government Survey Shows Marked Improvement in Antiknock Value. Sulphur Content Increasing

By A. J. Kraemer, E. L. Garton and E. C. Lane, and N. R. White and H. K. Cummings
Bureau of Mines* Bureau of Standards*

This paper is the third and concluding report of the results of the U. S. Bureau of Mines twenty-third semiannual survey of motor fuel marketed in the United States. The first paper, reporting data relative to gravity, vapor pressure, and distillation range of the samples, was published as Report of Investigations 3,129. The second report dealt with the data of the twenty-third survey in accordance with the revised specifications for United States Government Motor Gasoline. These data were published as Report of Investigations 3,142.

The present paper deals primarily with results of the determination of "gum" content of the samples by means of the "copper dish" method, and the Bureau of Mines steam-oven method, and with "octane number" ratings on the individual samples. The color of the samples and the doctor test are also reported, as well as the retail price and tax at the time each sample was taken. The sample numbers used throughout this report are identical with those used in Reports of Investigations 3,129 and 3,142.

This is the first semiannual motor-gasoline survey of the Bureau of Mines in which data were obtained on antiknock values, or octane number ratings, for individual samples in the survey.

In R.I. 3,092 results of octane number ratings made by the Bureau of Standards on composite samples of competitive-price gasolines and premium-price motor fuels were reported. The Bureau of Mines is not provided with equipment for making octane number ratings in its own laboratories, and individual samples in the present survey were tested in the laboratories of the Bureau of Standards.

A total of 312 samples was collected from service station pumps in 20 cities throughout the United States. Of this number, 207 samples were "competitive-price gasolines," and 105 were "premium-price motor fuels." All of the samples were collected in March, 1931, and analyzed at the Petroleum Experiment Station of the U. S. Bureau of Mines at Bartlesville, Okla., except for the octane number ratings, which were determined in the Bureau of Standards laboratories at Washington, D. C.

"Competitive-price gasoline" includes those fuels that are sold at the generally recognized local base price and all fuels that are sold below that price. All fuels that are sold at an advance over the generally recognized local base price are placed in the class of "premium-price motor fuels." These fuels include Ethyl Gasolines, benzol blends, "high-test" fuels, and those fuels that owe their antiknock rating to the process of manufacture rather than to the addition of other material, such as Ethyl fluid or benzol. The term "high-test" is generally applied to motor fuels that are more volatile than the regular competitive-price gasolines. A "high-test" fuel does not necessarily also have a high antiknock rating.

Color of Sample

Color of the samples was determined by means of the Saybolt chromometer in accordance with A.S.T.M. method D156-23T.

Of the competitive-price gasolines, 48 samples, or 23.2 per cent, were artificially colored; 21 samples, or 10.1 per cent, were darker than 10 Saybolt, and 138 samples, or 66.7 per cent, had color lighter than 10 Saybolt. Of the premium-price motor fuels, 97 samples, or 92.4 per cent, were artificially colored, 1 sample was darker than 10 Saybolt, and 7 samples, or 6.6 per cent, had color lighter than 10 Saybolt.

*Reprinted from U. S. Bureau of Mines Report of Investigations 3,152.

SUMMARY OF MOTOR FUEL SURVEY

Of the 312 samples of motor fuels collected at filling stations in all parts of the United States on March 1, 1931, and tested by the Bureau of Mines and the Bureau of Standards and reported in the government's twenty-third semiannual survey of motor fuels, more than 80 per cent of them had an octane number of 60 or above.

The list of total samples contained 207 of the competitive grade and 105 of them were premium motor fuels, including Ethyl Gasoline, benzol blends and some which called for a premium only because of their volatility and not because of any superior antiknock value.

The average octane number of the competitive gasolines was 62.5 and the average for the premium fuels was 77.0, or an increase for all of 3.3 within the 6 months between making the twenty-second survey and this one.

It is also interesting to note that of the competitive samples only 17.4 per cent of them were below 60 octane number, 32.4 per cent were between 60 and 65, 22.7 per cent were between 65 and 70 and 15.9 per cent were 70 or higher. Similarly, of the 105 premium fuels only 10.5 per cent were below 70 octane number, 16.2 were between 70 and 75, 43.8 were between 75 and 80 and 29.5 per cent were 80 or above. All antiknock values were determined on the new C.F.R. engine.

Equally valuable results are shown in the survey regarding color, sulphur content, corrosion test and gum content of the gasolines marketed.

The survey indicates that refiners are no longer sacrificing antiknock value to simply improve color to the extent practiced in previous years. Artificial coloring was contained in 23.2 per cent of the total.

In regard to the doctor test, only 20 samples did not show a negative result. Of this number it may be surprising that half of them were premium fuels. The results of the copper dish test prescribed by the Atlantic Refining Co. as an improvement over the generally accepted method, show that 90.6 per cent of the gasoline was within permissible limits with the results expressed as "copper dish gum." Only 6.2 per cent were doubtful and 3.2 per cent showed excessive gum. Expressed as "performed" gum, as determined by the steam oven test, 92.3 per cent had a gum content less than 5 milligrams per 100 milliliters, 3.8 per cent had 5 milligrams and 2.6 per cent had 10 milligrams.

A growing tendency toward a higher sulphur content in gasolines is also shown by the survey, in which it is reported that 14.2 per cent of all samples contained more than .1 per cent sulphur.

The detailed information which the authors have included is of unusual interest because of the discussions being prompted by the question of raising the octane number of motor fuels. It must be kept in mind also that these samples were collected more than 8 months ago and in the meantime many refiners have substantially increased the octane number of their gasolines.

The above summary and the data for individual samples given in Table 2 indicate that the gasolines being marketed at present are in general more highly colored than those that were being marketed three or four years ago, as for example, the samples collected in the sixteenth semiannual gasoline survey and reported in R.I. 2,843.

The color of gasoline does not appear to have any special technical significance. A few years ago, the usual practice of petroleum refiners was to treat gasoline chemically to produce almost colorless motor fuel. This treatment seems to have had mainly a psychological effect because of the long-continued mental association of absence of color and purity of commodity, but during the past several years a growing tendency has been to eliminate the costly and wasteful practice of treating motor fuel to render it water white and color-stable. Aside from the cost of treatment in equipment, chemicals, labor and loss of material, in some instances the gasoline after treatment is not as good a motor fuel as before the color-forming bodies were removed. This is due to removal of constituents having desirable antidetonating qualities.

TABLE 1—SAMPLES SHOWING POSITIVE DOCTOR TEST

Sample No.—	Color Saybolt	Sulphur, per cent	Copper dish, mgm.
Competitive-Price Gasolines			
25	colored	0.06	10
55	colored	.07	10
56	colored	.06	nil
87	colored	.05	5
89	25	.06	5
91	colored	.05	5
93	25+	.04	10
94	below 10	.12	15
96	colored	.06	10
101	16	.05	5
Premium-Price Motor Fuels			
32	21	0.06	5
49	23	.06	15
65	colored	.05	5
82	colored	.06	5
97	colored	.03	5
99	colored	.03	5
100	25	.10	nil
114	below 10	.07	10
133	colored	.06	5
186	colored	.03	10

Doctor Test of Samples

Of the 312 samples included in this survey, 10 of the competitive-price gasolines and 10 of the premium-price motor fuels were positive to the doctor test; that is, they failed to pass the test. Data on these 20 samples are given in Table 1. These data seem to show that a positive doctor test does not indicate high sulphur content nor excessive "copper-dish gum" or "steam-oven gum." The gum shown by the steam-oven test was nil in all cases.

The doctor test is essentially a very sensitive chemical test for hydrogen sulphide and mercaptans. Probably the principal object that is achieved by rendering a motor fuel negative to the doctor test is to improve the odor of the product.

Copper-Dish Test

A summary of results by the copper-dish test are given in Table 2.

TABLE 2—CLASSIFICATION OF SAMPLES ACCORDING TO RESULTS OF COPPER-DISH TEST—ALL SAMPLES.

Residue in milligrams per 100 milliliters—	Per cent of samples
Nil	20.2
5	30.8
10	25.3
15	11.2
20	3.2
25	3.0
30	2.2
35	1.0
40	1.0
45	1.0
50	.3
55	.3
60	.3
65	.3
Over 100	1.0

The degree of reproducibility of results of the copper-dish test, and the degree of precision attainable in interpreting results in terms of performance, have been discussed in R.I. 3,092. In that report certain tolerances for reproducibility of results were suggested. Classification of the present series of determinations in view of those tolerances shows that:

1. Sixty-three samples, or 20.2 per cent of the total number, averaged 5 milligrams or less per 100 milliliters of sample and were reported as "nil."

2. Two hundred twenty-eight samples, or 73.1 per cent of the total number, varied 4 milligrams or less per 100 milliliters of sample in duplicate determinations and may be considered to have given check results.

3. The remaining 21 samples, or 6.7 per cent of the total number, varied more than 5 per cent from the mean value and did not give good check results. This is a considerably better concordance of results than was obtained in the twenty-second gasoline survey.

The results of the copper-dish tests reported in this paper were obtained by using a circular copper steam bath and by following a definite procedure, both of which were suggested by the Atlantic Refining Co., Philadelphia, Pa. The same hemispherical copper evaporating dishes were used as have been used in the past.

Sulphur Content

The Bureau of Mines made four investigations of the sulphur content of commercial motor fuels. (R.I. 2,843.) In these four surveys, 893 samples have been analyzed for sulphur content.

The data of these four investigations are not strictly comparable because of changes in the plan and scope of the motor gasoline surveys during the period covered by the reports. However, some general conclusions appear to be warranted:

1. The average sulphur content of commercial motor fuels has increased during the period covered by these surveys (July, 1927, to March, 1931).

2. The proportion of the samples that have more than 0.10 per cent of sulphur has increased. Although in the present survey 14.2 per cent of the samples had more than 0.10 per cent of sulphur, and in the previous survey 14.4 per cent of the samples were over 0.10 per cent; the fact that the present survey samples were collected in March indicates a tendency toward higher sulphur content, as sulphur content is usually maintained at a

(Continued on Page 98)

Combine Topping and Cracking in East Texas Operation

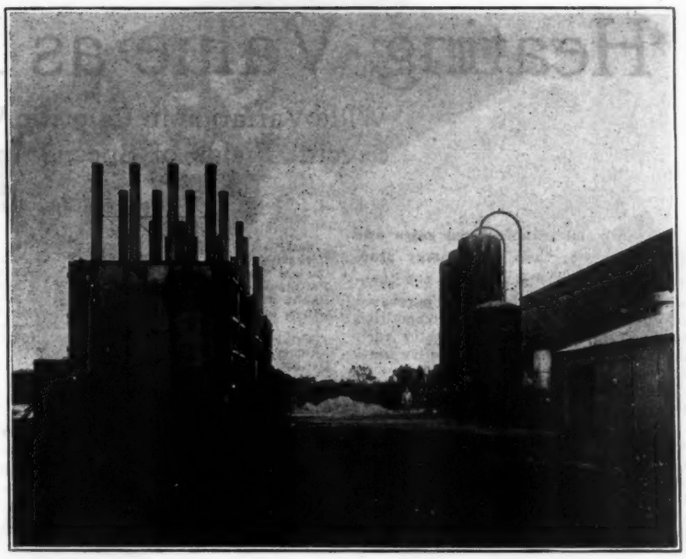
* * * * * *

By C. O. Willson

Combining crude oil topping and partial cracking in one continuous operation, the Taylor Refining Co. at its new Tyler refinery has materially increased gasoline yields and reduced the viscosity of heavy end products. The refinery which is the largest in the East Texas Field has a rated capacity of 15,000 bbls. daily and during the several months that it has been in operation, has refined up to 12,000 bbls. of crude oil.

The gasoline yield from the East Texas crude oil at the Tyler plant is averaging 45 per cent which compares with skimming plant recoveries of from 35 to 38 per cent. In contrast to conditions common to skimming plant operation, where cold tests are 100° F. or higher in the heavy end products, the Tyler operation is furnishing approximately 12 per cent zero gas oil, with a cold test for the remaining gas oil and fuel oil which meets the usual requirements for the commercial grades.

As shown in the accompanying photograph, the entire distillation, fractionation, heat exchange, condensing and water cooling equipment occupies a space approximately 150'x150' which is equivalent to three city lots. The fact that no steam is used, the plant being completely electrified, and the exclusive use of bent tube sections in condensing all the overhead streams are among the other unusual features of the plant.



View of Tyler, Texas, refinery of Taylor Refining Co., showing furnaces, towers and cooling tower.

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Rowsey Design

The plant was designed and built by G. L. Rowsey, president of the Taylor company which also operates a refinery, built last year, at Taylor, Tex. The Tyler refinery incorporates some of the features of plant equipment installed at the Taylor and other refineries built by Mr. Rowsey in the Mid-Continent Field with additional innovations. The plant was built in approximately eight weeks.

The Tyler refinery operates with crude oil obtained from the adjoining Rusk and Gregg County Fields. Crudes from the two fields vary slightly from well to well but in all important characteristics the crudes are the same so that the composite supply received at the refinery is uniform from day to day.

The accompanying laboratory distillation tests made recently by the Bureau of Mines are representative samples of Gregg and Rusk Counties crude oils.

The tests show the high viscosity of the heavy ends of the crude oil previously mentioned. In a straight skimming operation it means that the gas oil and fuel oil fractions will congeal in storage except during the hot summer period. The handling of these products by the consuming trade is a problem which has important bearing on the prices obtained by refiners.

The low sulphur content and type of sulphur compounds has made the treating operation relatively simple. No chemical treatment of the overhead products is required except sweetening in the case of gasoline.

Method of Operation

The method of operation is indicated in the accompanying flow sheet. The crude oil from storage first passes in series through six heat exchangers of the closed type. Three of the heat exchangers are for the hot fuel oil and three for gas oil. The temperature of the crude oil charge as it leaves the last fuel oil heat exchanger is 300° F.

The charge is divided at this point and charged to two tube stills. The stills are exact duplicates. Each still has two banks of tubes and above the banks are the roof tubes which serve as economizers. Each furnace has four dutch ovens and is fired from both ends. From the ovens the flue gases pass up through the banks of tubes and then through the roof tubes to the stacks.

The roof section for each still consists of 53, 4½-inch O. D. tubes, each 17 feet long. This section is connected in series with what is termed a cold bank and a hot bank. Each of these banks has 72 4½-inch O. D. tubes, 20 feet long. The cracking or reducing coil which adjoins the battery of crude topping stills is exactly the same design, except that the tubes are heavier for the higher pressure and temperatures at which it operates. These tubes are three-eighths inch.

The crude charge passes through the roof tubes and then the cold bank. The oil, leaving the stills at a temperature of 550° F. discharges above the second tray of a 12-tray bubble tower. This No. 1 tower is 8'x35'.

The overhead stream from the No. 1 tower is a 390 endpoint gasoline cut. The endpoint is controlled by refluxing the gasoline from storage at the top of the tower. The hot oil at the base of the tower is picked up by two hot oil transfer pumps of the centrifugal type. Each pump delivers the hot charge to the remaining hot bank of the crude oil stills and the temperature of the oil is increased to around 675° F.

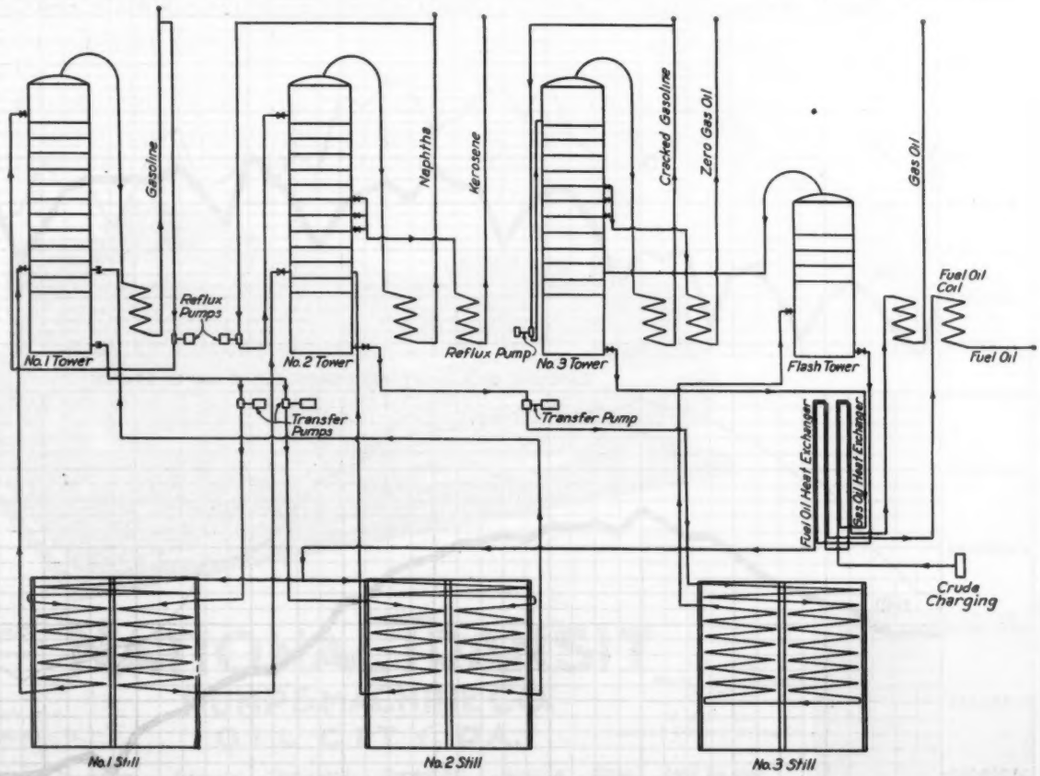
This oil is discharged into the second tower as shown in diagram. The overhead cut from this tower is a 440 endpoint naphtha which is blended back with the low endpoint gasoline cut of the No. 1 tower to meet any specifications required by the marketing department. In addition, a side cut of kerosene is taken from the tower. This product is taken from one of three pans in the tower depending on the kerosene specifications required.

Cracking Operation

The crude charge which has now been topped of its light end products is picked up by a 10,000-bbl. centrifugal hot oil pump and charged to the cracking stills. The movement of the oil is in series through the economizer roof tubes and the two tube banks. A pressure of approximately 150 pounds is maintained on the tubes and the oil is discharged into a 8'x20' flash tower where a constant pressure of 50 pounds is maintained. This flash tower has four bubble trays.

All of the charge is vaporized in the flash tower except the residuum fuel oil which passes through the heat exchanger and cooling coil to storage. The vapor

(Continued on Page 101)



Flow chart showing combination topping and cracking operation at Tyler, Texas, refinery of the Taylor Refining Co.

Heating Value as Basis for Gas Sales

Wide Variation in Calorific Value of Gases Obtained From Several Fields of Special Importance to Industrial Users

By Roy O. Neal
Consulting Engineer, Tulsa, Okla.

Natural and manufactured gases owe their utility to their heat energy properties. In reality, B.t.u. and not thousands of cubic feet of gas is purchased by the consumer, so that as competition becomes more pronounced with the various fuels, the economics of effective heating value will be the dominant factor in merchandising campaigns for service extension.

In the centers of population, larger apartment houses have been displacing the smaller houses, home baking and laundry work have been declining, so that the noncompetitive domestic load is declining. It is apparent, especially during periods of depressed business conditions, that thought is being given to the calorific value of competitive fuels. During 1929 natural gas consumption was distributed as follows:

Sales—	Millions cu. ft.	%
Domestic	359,853	29.6
Carbon black plants	261,107	21.6
Petroleum refineries	103,739	8.6
Public utility power plants	113,707	9.3
Other industrials	374,972	30.9
Total	1,213,368	100.0
Other uses—		
Drilling, pumping, gasoline plants	705,083	
Total gas production	1,917,451	

The quality (calorific value) does enter into the sale of gas to domestic consumers, but it is more important from an industrial user's standpoint and this paper will deal largely with industrial consumption.

Many industrial consumers require a gaseous fuel and in some cases it is preferable to have a lower heating value gas containing hydrogen because it favors surface heating of refractory materials to high temperatures, and because the rate of propagation of flame through cold mixtures of gas and air is so great with hydrogen that a short flame can readily be obtained. Gaseous fuel is sometimes required because of its properties to form an oxidizing, neutral or reducing atmosphere in furnaces and also because of the absence of sulphur in the gas. Therefore, there are some cases where there is no substitute for gaseous fuel and also a few instances where a high hydrogen content (low heating value) gas is advantageous.

New Developments

Several new developments have taken place in the past few years that appear to make gaseous fuels more widely available and possibly more competitive with each other until the exact economic status of each fuel in the industry of a particular geographic location is more definitely established. These developments are extensions of long pipe lines from gigantic natural gas reserves, the use of liquid hydrocarbons, the sale of large quantities of gases from cracking stills at petroleum refineries, and the re-forming process using natural gas, refinery gas or liquefied hydrocarbons such as butane.

The extension of pipe lines has been made possible through the success of the manufacturers of pipe in fabricating cheaply, a relatively thin walled pipe of uniform thickness and possessing a high strength by such methods as flash welding. The assurance of future supplies of natural gas has been made possible by the effective conservation programs of the combined and co-ordinated efforts of the oil and gas producer, natural gaso-

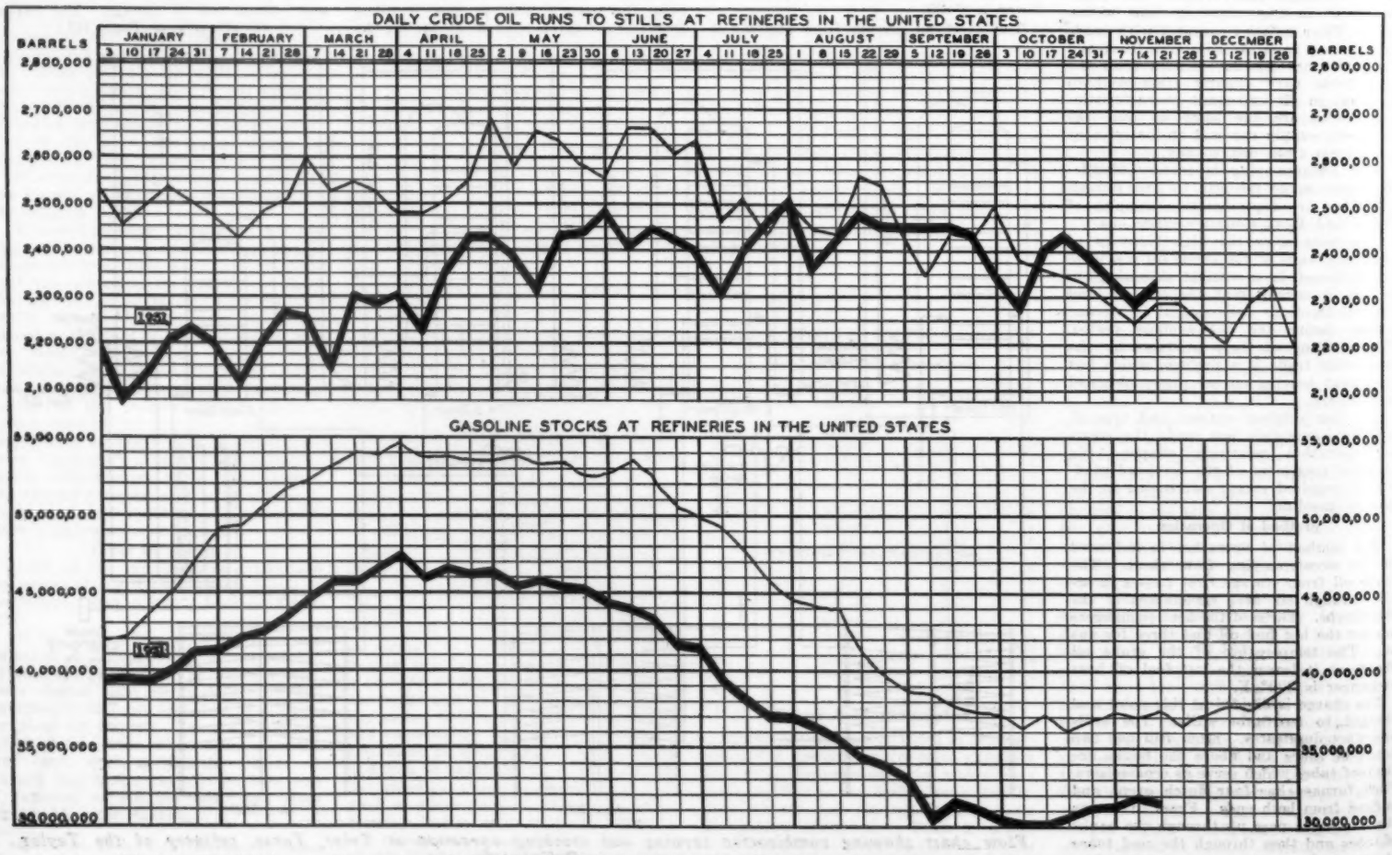
(Continued on Page 81)

AMERICAN PETROLEUM INSTITUTE WEEKLY REFINERY STATISTICS

The weekly report made to the American Petroleum Institute on refinery statistics—crude runs to still, gasoline stocks and gas and fuel oil stocks in barrels—for the week ending November 21.

	Week Ending November 21				Week ending November 14, 1931				Week Ending November 22, 1930			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
East Coast	100.0	404,900	4,127,000	10,209,000	100.0	467,000	4,066,000	10,234,000	100.0	429,400	5,343,000	11,566,000
Appalachian	91.8	99,900	1,201,000	1,634,000	91.8	92,000	1,252,000	1,635,000	93.8	71,300	766,000	1,029,000
Indiana, Illinois, Kentucky	98.9	311,600	3,232,000	5,776,000	98.9	321,300	3,205,000	5,664,000	97.5	257,600	4,270,000	3,914,000
Oklahoma, Kansas, Missouri	81.6	244,700	2,665,000	4,892,000	89.6	257,400	2,734,000	4,876,000	89.4	258,100	2,108,000	4,603,000
Texas	91.3	567,000	6,504,000	11,838,000	91.3	544,700	5,650,000	11,713,000	91.9	527,400	6,393,000	10,730,000
Louisiana and Arkansas	98.9	159,700	952,000	4,053,000	98.9	163,400	850,000	3,924,000	98.3	148,100	1,253,000	2,138,000
Rocky Mountain	89.4	46,000	1,295,000	810,000	89.4	41,000	1,263,000	810,000	93.1	45,300	1,509,000	1,017,000
California	97.1	427,800	12,535,000	97,052,000	97.1	456,200	12,871,000	97,271,000	98.8	553,600	14,890,000	104,257,000
Total United States	95.2	2,261,600	32,511,000	136,264,000	95.2	2,343,000	31,891,000	136,127,000	95.7	2,290,800	36,532,000	139,254,000
Texas Gulf Coast	91.8	425,300	4,964,000	8,504,000	99.8	416,100	4,170,000	8,425,000	100.0	406,700	5,149,000	8,000,000
Louisiana Gulf Coast	100.0	106,700	327,000	3,264,000	100.0	112,600	746,000	3,089,000	100.0	101,900	986,000	1,173,000

(1) Per cent refinery capacity represented. (2) Daily crude runs to stills. (3) Gasoline stocks. (4) Gas and fuel oil stocks.



Data for 1931 based on weekly reports of the American Petroleum Institute. Figures for last week not shown in graph but are included in above tables.

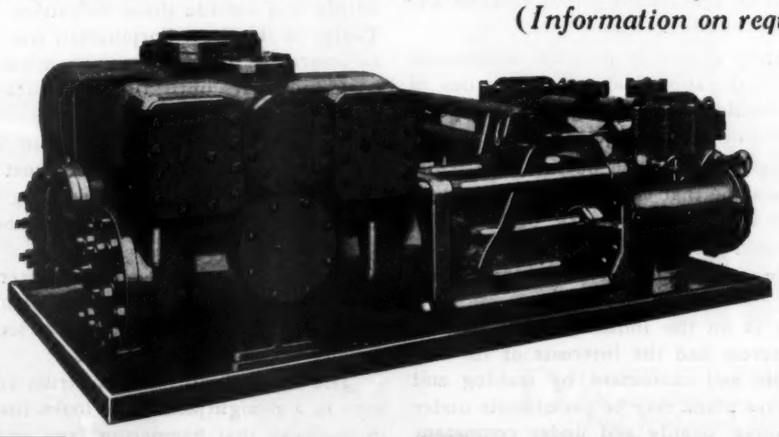
The temperature of the fluid pumped is immaterial

The new TRANSIT Heavy Duty Block Valve Pump was designed to handle either hot or cold liquids or semi-liquids around refineries. The material pumped is introduced and expelled from the pump through large direct fluid passages that cannot trap air, and through special design valves now made larger than ever.

This pump can be operated so hot that the fluid end will glow on a dark night, and so cold that frost will form on the fluid end. No trouble will be experienced from loose valve stems, loose valve guards, or loose separate valve seats, because such things are not part of this pump.

Pumping hot tar around 700 degrees Fahrenheit is hard on rod packing. So the stuffing boxes are made deeper to lessen wear on the packing and rods. Tie-bar construction renders the stuffing boxes easier of access, thereby inviting more frequent and accurate adjustment.

(Information on request)



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RUTHLESS COMPETITION

Timid souls in the oil business who fear restriction of production to market demand might be considered restraint of trade should be heartened by two notable utterances on the subject, made before the Third International Conference on Bituminous Coal at Pittsburgh, Pa.

One speaker was Myron C. Taylor, chairman of the finance committee of the United States Steel Corporation, and the other Gov. Albert C. Ritchie of Maryland, who is being mentioned as a Democratic possibility for president.

Said Mr. Ritchie: "Ruthless competition we now find can often do more harm than good to the consumer if we see the picture as a whole. So it seems to me that in your industry a consolidation of mines into bigger units by co-ownership and co-association of the use of selling agencies, with production adjusted to meet demand at a just price, may not be against the public interest and may prove advantageous to both producer and consumer."

Strange language, indeed, from a man in politics, accustomed as we are to the familiar political yapping about the virtues of competition and the evils of consolidation. This governor appears to have not only common sense, but the courage to speak out.

Chairman Taylor was no less forcible when he said that while "there has been a tendency to assume that conditions could not be remedied by co-operative effort within the industry, because of a belief that our antitrust laws would prohibit any such co-operation as being in restraint of trade and commerce, I cannot share these views.

"The primary responsibility is on the industry itself to find ways to promote the public interest and the interests of its own producers, employes, distributors and customers, by making and carrying out whatever constructive plans may be permissible under the present laws, acting, of course, openly and under competent legal advice, and so far as possible in co-operation with the government.

"While I do not presume to express a legal opinion, I confess I find it extremely hard to believe that constructive, co-operative plans, sincerely undertaken for rationally adjusting production to demand in a basic industry, and which would avoid any attempt, artificially, to fix prices or control prices, can be regarded as in restraint of trade and commerce when the sole purpose and effect would be to remove the existing vital impairments of production, trade and commerce and to promote the public interest."

There is nothing in the antitrust law to compel anybody to overproduce coal or oil, or sugar or copper, or wheat or shoes. Since the determination of how much he shall produce rests with each producer, what is there wrong in the idea that the producers as a whole learn how much can be sold and limiting their production to that demand?

But, some will say, that will fix the price. Suppose it did, it would be a price that would be just, otherwise any excessive profit would quickly attract new competitors into the business and the price would be forced down by overproduction, a much quicker and more effective check against extortionate charges than any antitrust legislation can be.

That is the inevitable effect of prices out of line anywhere—invasion of the market by new competitors, followed by collapse of the price structure in the scramble for business.

Popular fear of monopoly at the time the antitrust laws were enacted arose from entirely different conditions than those existing today. Those were "the public be damned" days, the age when "let the buyer beware" was the rule of trade and there was more glee over "sticking" a customer than satisfying one.

The world has moved a long way from that point to this moment when "the customer is always right" is a motto actually lived up to. On every side we see the largest businesses striving to cut costs and keep prices down rather than inflate them. The old-time idea of the public always being gouged belongs to a past generation.

The notion that we must have cut-throat competition to keep prices down is out of step with the times. Price nowadays is a matter of efficiency. In the cases where it is not, it is temporary result of inefficiency, directly due to reckless overproduction or poor management.

The public, which has been led to believe that ruthless competition is to its advantage and that any steps to stop overproduction must be to the public disadvantage, ought to learn better from the experience of the past two years.

Too much of everything has ended in millions having too little because collapsing prices from overproduction forced shutdowns and general unemployment. The first sign of returning prosperity has been a strengthening of prices in an approach to living returns.

What the world has been going through, the coal and oil and copper and sugar industries have been going through for years on their own account because of their own overproduction.

And it is the recognition of this fact by thoughtful men, both within and outside these industries, men of affairs like Chairman Taylor of the Steel Corporation and Governor Ritchie, which must be impressed upon the public mind and upon the units in these basic industries until a definite effort is made to keep production in line with demand.

There is nothing subversive in this, no restraint of trade or commerce, no violation of antitrust laws, but simply a common sense understanding that producing more goods than can be sold means selling at a sacrifice and ultimate shutdowns and unemployment.

The world would be a lot better off today if it had limited production to requirements, held plant capacity to actual needs and kept its feet on the ground. Prices can become so cheap that nobody can buy.

The idea behind these antitrust crusades that business must be kept in a straightjacket overlooks the fact that we are all partners in business, that hampering laws, extortionate taxation and other obstacles in the way of recovery have a way of reaching down and grabbing all of us in one way or another eventually.

We hear a great deal nowadays about the unity of the world, of how events in one country react upon all others, but we seldom think of the more immediate unity of the American people and their common interest in the everyday business of the country which affects us all.

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New Laboratory Houses Unique Development and Research Equipment

* * * * * *

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Nov. 23.—The Bayway, N. J., laboratory of the Standard Oil Development Co., a subsidiary of the Standard Oil Co. of New Jersey, is now housed in its recently completed building. A brick building of three stories, the new "lab" is something of a departure from the usual concept of a shelter for beakers, retorts, and a corps of chemists.

Two features immediately strike the visitor to the new research plant. One is the absence of the pungent odors usually associated with chemicals. The other is the equally unusual absence of chemicals, beakers, retorts and other laboratory paraphernalia beyond that actually in use. Blowers shooting filtered air through the rooms and corridors at three changes per minute, with suction fans transferring the atmosphere in the building to the outdoors four times a minute, account for one of these features. Workers with small hand trucks carting material periodically to and from a central storehouse are the cause of the other. When Standard Oil Development Co. moved from its old building, it found a veritable mine of "dead stock"—chemicals and equipment—hidden away in the conventional drawers and cabinets.

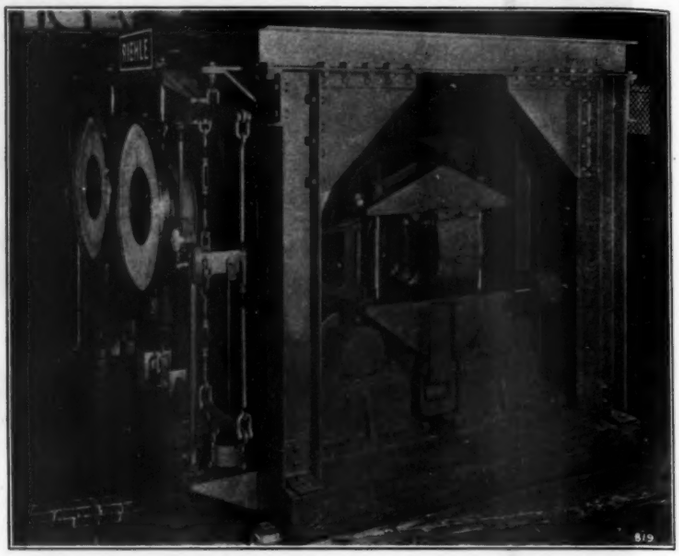
The most striking phase of the new research laboratory, however, is the fact that it is not satisfied with test tube and beaker results. Practically the entire ground floor is given over to what might be termed an industrial laboratory.

When a discovery warranting further investigation is made in the research division proper, it is sent downstairs to this industrial laboratory. Here are semi-commercial filter presses, rectifying columns, heaters and furnaces, with space for additional special equipment as needed. The problem is "worked" on the 1-bbl. plant, and thence, if further research is deemed necessary, progresses to a 10-bbl. plant and finally to full scale operation. "Paraflow," the company's new motor oil pour inhibitor, was developed in this way, although the work on this product was done at the Baton Rouge laboratories.

Two-story height is provided for this research laboratory at Bayway, permitting ample room for the rectifying columns.

Laboratory Railroad

The new laboratory building, recently finished and placed in operation, is the nucleus of a group of three structures. It is flanked on one side by the motor laboratory, with its "stationary highway," cold room, dynamometers and high altitude chamber. In one corner of this building is the newly installed "laboratory railroad," which measures the effectiveness of railroad lubricants with the same accuracy that other instruments show in testing automotive oils. This "laboratory railroad" in itself is unique as a piece of research equipment. Some months ago company engineers became curious as to how railroad lubricants actually behaved when a train is thundering over the rails at 30 to 90 miles an hour that they decided to bring one into the "lab" and study it. This apparatus, built by Riehle Brothers in Philadelphia especially for the Standard Oil Development Co., is, as far as is known, the only one of its kind in the world. Between the two upright supporting girders are mounted huge railroad car wheels which can be revolved at anywhere from 6 to 90 m.p.h. with all the swaying, pull, and stresses of actual railroad operation. Adjustable weights can bring the load up to 25,000 pounds on each journal—corresponding to the heaviest freight car loadings of 200,000 pounds.



Side view of "stationary locomotive" at new Bayway, N. J., research laboratory of the Standard Oil Development Co.

* * * * * * * *

Waste soaked with different types of lubricants is packed in the journal box and the effect at various loads and speeds may be observed through glass covered holes cut in the side of the box. Temperatures may be regulated from desert-hot to sub-zero, and a special blower simulates the rushing air at various speeds. Thermocouples, gauges and the huge torque and traction dials in front of the apparatus tell the whole story to the development company's research engineers.

On the other side of the central building is the fuel and lubrication laboratory. Here is housed the acceleration machine, Mougey oil testing apparatus and similar testing devices.

Offices

On the second floor of the new building are the offices of Dr. George M. Maverick, director of the development company's research laboratories; Dr. Per K. Frolich and Walter E. Lee, assistant directors, and their associates.

No fumes from the laboratories reach the offices. The powerful suction fans take care of that. One other point is interesting. Quite a discussion arose when it came to laying out the offices. It was essential that key men in the organization have privacy, but at the same time research men must work together. Contact was necessary. The problem was solved by glass-inclosed offices, with all staff members visible to one another. So a commonplace arrangement serves a valuable purpose.

The Bayway laboratories of Standard Oil Co. (New Jersy) have attained wide fame for their contributions to the technical knowledge of the industry. Research activities are directed along lines which may be defined as exploratory research, aimed at underwriting the future position of the company; research of a semi-academic nature; the more practical problems dealing with waste products, and the conversion of natural and refinery gases into valuable chemical compounds.

The research laboratories are under the direction of George M. Maverick, and are divided into two operating units, the chemical and the fuel and lubrication laboratories.

The chemical laboratories are directed by Per K. Frolich, formerly assistant director of the Laboratory of Applied Chemistry at the Massachusetts Institute of Technology, and recipient of the 1930 Grasselli Medal award. A liaison unit, headed by Carl Willing, assists the chemical director in all outside contacts, correlation of data and other duties of a general administrative nature.

Research Work

The chemical laboratories are subdivided into working groups under the direction of key men. These groups in general work on allied research projects and thereby a community of interests is maintained. One research group, directed by H. E. Buc, senior research chemist, assisted by R. R. Rosen, is working on problems relating to oxidation phenomena, gum inhibition, preparation of pure hydrocarbons from light petroleum fractions, desulfurization, and problems dealing with polymerization and condensation.

A second group, under Louis A. Mikeska, senior research chemist, assisted by F. L. Miller, is engaged in the synthesis of complex organic compounds closely related to lubricating oils, utilization of spent treating agents, synthetic resins and studies on the properties and preparation of greases, compounded oils and pour inhibitors.

The industrial group, directed by P. J. Weizevich, is a chemical engineering unit engaged in barrel scale workings of promising laboratory problems. The young hopeful is taken for a ride and suddenly finds itself in the hands of the bucket and barrel chemical engineers. Here its past record is probed, and its future possibilities determined. If it can pass through this ordeal, and if "Mr. Cost Estimate" doesn't frown too severely, then semi-commercial workings are needed and the infant product is turned over to another technical organization which tries out the process with the equipment commonly employed in industry.

Service Tests

A service group, headed by E. L. Baldeschwieler, handles all analytical work and specialty products developments, inspection work on physical constants of oils, greases and white products, and all gas analyses and fractionation of gases and light hydrocarbons by low temperature methods.

The fuel and lubrication laboratories, under the direction of Walter E. Lee, assistant director and formerly industrial engineer for Fairbanks, Morse & Co., assisted by W. C. Baner, general assistant, and A. J. Blackwood, automotive engineer, is a veritable proving grounds for automotive fuels and lubricants, industrial lubricants and service station dispensing equipment. Here is seen the apparatus for all manner of tests on fuels and lubricants, from the conventional knock engine to the "laboratory railroad" previously described. Here, too, is found the "torture house" for lubricants, where any oil or grease may be tested under conditions so severe that the wildest stretch of the imagination cannot conceive of such conditions being encountered in actual service. Cold rooms, altitude rooms and a stationary highway complete the picture, and here any automobile from an Austin to a 10-ton Mack truck can be put through their paces and operating characteristics and

(Continued on Page 100)

View of buildings at Bayway, N. J., housing research and development laboratories of the Standard Oil Development Co., a subsidiary of the Standard Oil Co. (New Jersey).

Now is the best time in history to install the Dubbs cracking process

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..Dubbs units can be built today at the lowest cost in years—material and labor costs are down

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Supreme Court Sustains Gas Order

Bandini Company Loses Case Challenging Validity of California Gas Conservation Law. Lower Court Upheld

WASHINGTON, D. C., Nov. 23.—The Bandini Petroleum Co. lost its case in the Supreme Court against the validity of California's oil and gas conservation statute.

The court approved a California court order restraining oil and gas companies from releasing gas into the air pending a test of state conservation legislation.

The California statute, enacted in 1929, prohibiting the unreasonable wastage of natural gas in the production of oil in that State, was declared by state counsel to constitute not only a conservation measure, in the interests of the general public, but a protection of the rights of adjoining landowners in oil fields.

The case was that of the Bandini Petroleum Co. and others v. Superior Court of California for the County of Los Angeles and others, No. 43 in which oil companies challenged the validity of the law. Arguments in the case, begun on October 13, were concluded on October 14.

Counsel for the petroleum companies, Robert B. Murphey, argued that the statute passed by the California legislature was uncertain as far as the standards which it set were concerned, and therefore invalid. He referred particularly to the fact that the statute merely refers to the "unreasonable waste of natural gas." He contended that the word "unreasonable" does not establish a definite standard.

In reply to a question of Justice McReynolds as to whether the word "waste" by itself would establish a sufficiently definite standard, Mr. Murphey replied that he did not think it would. He called the court's attention to the fact that a great many people had different conceptions as to what really constituted "waste" in the production of gas and oil.

James S. Bennett, attorney for the Director of Natural Resources for the State of California, explained that the California courts have decided that the owner of land has the right to produce his reasonable proportion of the underground supply of gas and oil. He stated that they had rejected the theory that the owner was entitled only to the particular supply which might be located directly under his land.

The State's counsel claimed that in the light of this interpretation of the law, the use of the word "reasonable" becomes clear and does set forth a definite standard because "reasonable" then means that the owner of land is entitled to his proportionate share of gas and oil.

Mr. Bennett said that in conformity with this theory of the law the California court in this case had decided that a certain amount of gas flow was to be permitted during each average day for the entire field. Then, he said, on the basis of this total amount each owner of land had been allotted his proportionate share. He pointed out that if any operator took more than his share he would be causing an "unreasonable waste."

Mr. Murphey argued that the statute was unconstitutional because its sole purpose was to conserve gas for the future benefit of the general consuming public and was not enacted merely to protect the rights of the owners of lands in which the supply of oil and gas was found.

He stated that the primary purpose of setting up a definite consumption figure for the entire field was to save gas for the consuming public rather than to protect the rights of adjoining landowners, and that, therefore, the petroleum companies were being deprived of property for the use of the public without just compensation.

Justice Sutherland asked if the California court did not reject the idea that the law was a conservation measure. Mr. Bennett replied that he did not think the court had rejected this idea although it did place emphasis on the fact that it was a measure designed to protect adjoining landowners.

In this connection Mr. Bennett also informed the court that he felt the statute would apply even though a single landowner was involved and the rights of adjoining landowners were not in issue.

U. S. Court Decides Mississippi Cannot Tax Interstate Lines

WASHINGTON, D. C., Nov. 23.—The State of Mississippi has no right to tax interstate pipe lines, the United States Supreme Court decided today.

The case was brought by the State against the Interstate Natural Gas Co. to test its right to impose a license tax based upon the size and number of miles of pipe within the State boundaries. It was contended that although the pipe line was but a part of interstate facilities the action of the company in tapping the lines for Mississippi consumption gave the State the right to tax the lines.

DOLLAR OIL RUMORED IN EAST TEXAS FIELD

AUSTIN, Tex., Nov. 23.—Strong unofficial opinion prevailed among oil men closely observing the East Texas situation, that $1 oil and 100-bbl. daily well limits will arrive in East Texas together within the next few days. The present well limit is 125 bbls.

Governor Sterling's tour of the field was assumed to be a basis of a possible further restriction in the well output of the field, or possibly some step toward the acreage-unit limit of production to have about the same effect. No official comments were made on this situation.

Late Fields

KANSAS

The Viola lime production in the Ritz-Canton Pool, in McPherson County, Kansas, was extended approximately 1 mile north and east by the Darby Petroleum Corp. and others' No. 4 A. Kaegi, SE cor. NE NE, Section 20-19-1w, which filled up 3,300 feet, from the Viola at 3,371-72 feet.

Skelton Oil Co. and others' No. 1 Ott, C SE SE, Section 16-19-14w, Barton County wildcat, found a showing of oil at 3,228-54 feet. It filled up 400 feet, and was shut down. It is located 14 miles east of Dewey & Mitchell's well in Section 17-19-16w, Rush County, and 26 miles west and north of Hilligoss and others' No. 1 Isern in Section 12-20-11w, Barton County.

New development work in Kansas includes three new tests offsetting wildcat wells that have been completed for some time, but were recently connected to a pipe line. J. A. Aylward and others' No. 1 in the C SW NE, Section 1-17-10w, Ellsworth County, is a rig. The new test is a quarter of a mile north of the same operators' No. 1 Stratman, which was completed several months ago and shut in. It was estimated to be a 2,000-bbl. well in the Silicious lime at 3,255-71 feet. This well is being connected to a pipe line and loading rack and will make a production test in a few days. The Stanolind Crude Oil Purchasing Co. is connecting the well and will purchase the crude oil. Derby Oil Co.'s No. 1 Berscheidt, NW cor. NE SE, Section 12-20-11w, in southeastern Barton County, is a new location. The Mid-West Exploration Co.'s No. 1 A. Allen, SW cor., Section 31-22-11w, Stafford County, is a new location, offsetting to the northeast the only producing well in the county, completed by the same company, and making 1,200 bbls. a day.

The Stanolind Crude Oil Purchasing Co. will purchase the oil from Slick, Pryor and Lockhart and others' wildcat, No. 1 Heiken, NW cor., Section 25-17-10w, Ellsworth County, which was completed over a year ago and has been shut in since. It was the first test in Ellsworth County to find oil. The Stanolind Crude Oil Purchasing Co. is preparing to connect to L. E. Cress and others' No. 1 Sharp, SE cor. NE, Section 13-20-10w, Rice County, northeast of the Schurr Pool, near Raymond. The well has been shut in for several months. When completed it was estimated to be a 1,500-bbl. well from the Silicious lime at 3,330-36 feet. This well is approximately 1½ miles from the Prairie Pipe Line Co.'s line, which will connect and deliver the oil to the Stanolind Pipe Line Co.'s line in Greenwood County.

National Refining Co.'s No. 1 Watkins, C SW, Section 13-23-30w, Finney County wildcat, in the western part of the State, was drilling at 2,010 feet on the last report.

OKLAHOMA

Stanolind Oil & Gas Co.'s No. 2 Jones, SW cor. SE NW, Section 20-9-6, in the Seminole Field in Oklahoma, was plugged back from the Wilcox sand to the Calvin sand at 2,770-75 feet, where the casing was ripped and the test suddenly broke loose and made a flow. The well is estimated to be good for 1,000 bbls. of oil and 10,000,000 feet of gas a day. Previous to this the operators in the Seminole Field believed that only gas would be found in the Calvin sand. The No. 2 Jones was drilled by the McMan Oil & Gas Co. before its properties were purchased by the Stanolind Oil & Gas Co. It had the Wilcox sand at 4,256-65 feet.

The Carr City extension area continues to attract more new drilling operations. Pure Oil Co.'s No. 2 Tiger, SE cor. NE SW, Section 3-8-5, is a new location and the Amerada Petroleum Corp.'s No. 5 Tiger, NW cor. SE NW, Section 3-8-5, is a new location. These two locations make a total of seven for this pool within the last few days.

In the Fish Pool, south of Wewoka Townsite along the boundary line of Hughes and Seminole Counties, Empire Oil & Refining Co.'s No. 2 D. Fish, SW cor. SE SE, Section 19-7-8, is a location.

The wildcat test in the Sacred Heart area of Pottawatomie County was shut down. Mid-Continent Petroleum Corp.'s No. 1 Farmer, SE cor. SW NW, Section 2-6-4, found a showing of oil at 3,431 feet and after drilling to a total

(Continued on Page 104)

High Spots in Field News

WEST TEXAS

Ward County well good for from 75 to 200 bbls. Ten locations staked in Ranger district; two in Panhandle.

KANSAS

New wildcat wells find production in Barton County. Wildcats that have been shut in being connected to pipe lines.

SOUTHWEST TEXAS

Pettus extension looks like good well. Operations pick up in Balcones Fault zone. Three new locations at Darst Creek.

OKLAHOMA

Ten new operations starting in Carr City, Seminole district. Potential of Seminole district indicates decline of 18 per cent.

GULF COAST

Wildcat indicates possible second Refugio field. Second good producer at Markham. Thompson deep sand further proved.

NORTH LOUISIANA-ARKANSAS

New gas field near Louisiana border. Well in Shelby County looks good for 30,000,000 feet. One completion in Mississippi.

CALIFORNIA

New field opened at San Miguelito by definite proving of Continental's discovery between Rincon and Ventura Avenue fields.

EAST TEXAS

East Texas completed 142 producers during week and reported 95 new locations, 50 in Gregg County, 34 in Rusk, 5 in Smith and 4 in Upshur.

ROCKY MOUNTAIN AREA

Colorado, disappointed in Greasewood and Morgan County, was cheered by new oil showing in test 6 miles southeast of Greasewood. Resumption of wildcat drilling in southeastern New Mexico indicated.

East Texas Completes 142 Producers

Ninety-five Locations Made, 50 in Gregg County, 34 in Rusk, 5 in Smith and 4 in Upshur County. Governor Visits Area

By L. E. Bredberg

DALLAS, Tex., Nov. 23.—Total daily production in the East Texas district had reached 393,939 bbls. on November 22, another four days' time bringing the daily average to over 400,000 bbls. at the present rate of daily completions. There were 142 producers completed in the district during the week, a gain of 21 over the previous week. One test was abandoned and one location was abandoned. Major oil companies completed 72 of the producers, and small companies and independent operators completed the remaining 70 wells. Sinclair Oil & Gas Co. completed a total of 13, Shell Petroleum Corp. was next with 10; Humble Oil & Refining Co., 9; Magnolia Petroleum Co., 7; Arkansas Fuel Oil Co., 5, and The Texas Company, 5. Seventy-five of the completed wells were located in Gregg County, 44 in Rusk, 10 in Smith, and 13 in Upshur County. There was a total of 3,131 producers in the field on November 22, and as of 7 a.m. November 23 there were 3,154 completed wells in the district.

There were 95 locations staked in the district this week, against 91 of the past week. Fifty were made in Gregg, 34 were staked in Rusk, 5 in Smith and 4 in Upshur County.

Governor Sterling made an inspection tour of East Texas oil fields on November 24 and 25, and visited at the general headquarters of the National Guard contingent at Kilgore, and inspected the camps at Gladewater and Overton. Operators and company men are expecting a new proration plan to be issued soon by the Governor, possibly the acreage basis plan, or a somewhat modified plan for the field, and some new plan will have to be put into effect immediately unless the wells are to be cut back the fourth time, from the present daily allowable of 125 bbls. per well. When the field was opened in September, after having been shut in on August 17, wells were first allowed to produce 225 bbls. each per day, but this allowable has been gradually cut to the present daily allowable of 125 bbls. Many are in favor of continuing to curtail each well's production instead of trying out a new proration plan, but there are others who favor a change. A modified acreage basis plan considers investments and the number of wells per lease. A plan which gives consideration to these three prime factors in oil production may be of a more equitable nature than the acreage basis plan and prove more efficient in curtailing drilling and production in the field than the present well allowable plan. The Governor is considering the two different plans and may adopt one of the two, or decide to maintain the present well basis plan.

Distribution for the period ending November 16 showed the week's average runs totaling over 36.000 bbls. per day above the average daily production for the week, distribution averaging 407,586 bbls., while production averaged only 371,211 bbls. Shipments were as follows:

	Bbls.
Pipe lines	384,630
Refineries	19,422
Tank cars	3,534
Total	407,586
Daily avg. withdrawal from storage	36,375

As more wells are completed day by day, the production figure gradually increases, having a tendency to meet daily distribution regardless of any other factor, but at the present time some of the companies are releasing some connections, and one purchaser in the field, the Chalmette Refining Co. of Louisiana, has notified all parties from whom it has been purchasing oil that after 30 days it will no longer require any more crude. The Cherokee Chief Oil Co. and Tidal Refining Co. have both been shipping crude to this company by tank car, the former from Gladewater and the latter from Camps Switch.

The Texas Pipe Line Co. is releasing some of its connections, and is said to be turning over its two gathering systems in the northern part of Gregg County to the Empire Pipe Line Co. The Shell Pipe Line Co. and Gulf Pipe Line Co. have been seeking connections, therefore new connections and disconnections should about balance and maintain distribution at around its present figures.

Upshur County Test

Cranfill & Reynolds' No. 1 Rash, in the Eubanks Survey, southeastern Upshur County, which tested 27 fourbles of 35 gravity oil last week on an 11-minute drill stem test at a total depth of 3,728 feet, thereby showing up as a possible producer opening a new pool, possibly from a new pay horizon, or proving an extension of the far-flung Rusk-Gregg Field, remains shut down with casing cemented, while the owners are clearing titles to acreage around the test. The following is sample log from top of the Pecan Gap chalk, the first marker of interest in the test and in East Texas wells: Top Pecan Gap (broken) 2,418 feet; top Pecan Gap (hard) 2,490 feet; base Pecan Gap (solid) 2,891 feet; base Pecan Gap (broken) 2,950 feet; started coring at 3,495 feet, and from 3,495-3.613 feet shale with mica was cored. From 3,613-31 feet shale and sand striations; from 3.631-51 feet hard shale with sand; 3,652-70 feet chalk shale, possibly the Austin chalk. From 3,688-3,700 feet first 9 feet were hard gray chalk, next 3 feet hard chalk, except at 3,692 feet where 1½ feet of tightly cemented sand was logged. From 3,700-06 feet the first 2 feet showed chalk and shale, next 2 feet cap rock and following 2 feet bentonitic shale and white sand. Core from 3,706-09 feet was missing. From 3,709-11 feet cored white dry sand; from 3,711-28 feet recovered 9 feet of the core showing first 3 feet as shale, 2 feet sandy shale, 2 feet ash and oil sand and 2 feet bentonite and shale. Eight feet of the missing core is possibly oil sand with some ash. The hole was found to be 2½ degrees off vertical at the bottom. It is not known when the plug will be drilled and the well tested.

Joiner Locations

The Texas Company has made three locations south of production in the Joiner area, and in southern Rusk County. One is on the J. M. Price farm in the Thomas N. White Survey; one on the Allen Kirsh 211-acre tract in the E. B. Fowler Survey and one on the W. W. Henry farm in the southern part of the W. J. Rowan Survey. Peyton Brothers are rigging up on their No. 1 Perry, in the northwest corner of a 68-acre lease which is part of 136 acres in the L. N. Sparks Survey, approximately 3 miles south and a little east of production in the pool.

Stanolind Purchase

The Pure Oil Co. has one solid block of acreage between these tests, and several scattered tracts, which are considered as sure to produce. The Stanolind Oil & Gas Co. has taken a half interest in between 1,200 and 1,300 acres of the Pure Oil Co. acreage for a cash and oil consideration of around $2,000,000, and will develop the acreage for the two companies. The Pure Oil Co. acreage lies in the Milton Walker, T. M. White, A. Coleman, W. R. Perry, J. Hamby, J. H. Sparks and J. B. Camp Surveys. Stanolind is to pay cost of drilling and production of wells, and the costs later apportioned between the two companies. Different leases call for different consideration, some having special obligations to be covered by the purchasing company. Neither of the companies has pipe lines in the area, but connections to the leases will no doubt be made by other purchasing and pipe line companies which have lines traversing this area.

The Pure Oil Co. has not drilled a well in the East Texas district, and these leases are not to be drilled by the operating company until considered necessary. Stanolind Oil & Gas Co. is producing wells on its own acreage in Rusk and Gregg Counties, and also is developing several hundred acres owned jointly with the Simms Oil Co. in Gregg County.

This is the largest deal consummated in the East Texas district for some time, and promises another large source of production for the Stanolind Oil & Gas Co. in the district.

DISTRIBUTION REPORT OF EAST TEXAS
Week Ending November 16

Shipments Through Trunk Lines

Company, size, to—	Amount
Atlantic P. L., 10-in., Atreco	11,639
Arkansas P. L., 8-in., Shreveport	2,236
Atlas P. L., 8-in., Shreveport	3,120
Gulf P. L., 2-8-in., Oklahoma	26,465
Gulf P. L., 2-8-in., Port Arthur	670
Houston Oil, 8-in., Amigo	0
Humble P. L., 2-10-in., Shreveport	43,502
Humble P. L., 3-8-in., Todd	48,736
Liberty P. L., 8-in., Rusk	4,128
Magnolia P. L., 10-in., Center	20,762
Magnolia P. L., 12-in., Corsicana	45,763
Shell P. L., 10-in., Houston	25,556
Sinclair Texas P. L., 12-in., Teague	33,691
Sun P. L., 10-in., Sun City	34,792
Texas P. L., 10-in., Douglass	32,787
Texas Empire P. L., 12-in., Ft. Arthur	45,416
Tidal Refining, 6-in., Carthage	5,370
Total	384,633

Shipments to Refineries

Company and location—	
Arrow Refining, Overton	1,277
Beacon Refining, Henderson	1,752
Boone Refining, Arp	523
Central Refining, Friars Switch	S.D.
Constantin Refining, Overton	S.D.
Diamond Refining, Overton	449
East Texas Refining, Longview	3,620
East Texas Refining, Friars Switch	4,132
Gladetex Refining, Gladewater	98
Gladewater Refining, Gladewater	167
Kilgore Refining, Kilgore	693
W. B. Mackey Refining, Gladewater	293
Overton Refining, Overton	620
Petroleum Refractionating, Longview	1,112
Sinclair Oil & Gas, Longview	1,667
Slack Refining, Camp Switch	S.D.
Southern Oil Refining, Reed Switch	679
Taylor Refining, Tyler	2,346
Total	19,428

Shipments by Tank Car

Company, from—	Amount
Houston Oil, Kilgore	1,535
Cherokee Chief (Chalmette Ref.), Gladewater	485
Pilot Oil, Willow Springs	600
Tidal Refining (Chalmette Ref.), Camp Switch	395
Tyler Pipe Line, Tyler	620
Total	3,535
Total daily average distribution	407,596
Total daily average production	371,211
Daily average from storage	36,385

First Well Shot

The first well to be given a shot in the East Texas district was Martin Oil Co.'s No. 1 Elder in the Mary Van Winkler Survey on the eastern edge of the Kilgore Field. It was given a 20-quart shot from 3,536-41 feet, 30 quarts from 3,558-63 feet, 30 quarts from 3.588-03 feet and 30 quarts from 3,606-19 feet, a total of 110 quarts and is now cleaning out and preparing to test. The well refused to respond to swabbing. therefore, the owners considered the shooting as necessary in an effort to make a flowing well out of it. If this shooting proves successful it will set a precedent in the field, especially in the production of east edge wells which can be shot without danger of flooding by salt water. Wells on the western edge, the water side of the field, will not be shot, but will have to be put on pump, as several have already been equipped. Many of the wells

(Continued on Page 98)

EAST CENTRAL TEXAS WILDCATS

Week Ending November 23

ANDERSON COUNTY

Company, well, farm name, section and block— Remarks:

H. B. McConnell et al's No. 1 N. B. Watson, 500 ft. from W line and 4,850 ft. from N of S line of survey in S half of 129-ac. tract, M. Main Sur. ..... Rig up and S.D.

BOWIE COUNTY

Tom Bell's No. 1 Merritt, 1,225 ft. from N and 875 ft. from E line of survey, T. S. McKinney Sur. ..... Drlg. 3,450 ft.

Logan and Elliott's No. 1 J. W. Smith, 9,600 ft. S and 2,500 ft. W of NE cor. of survey, Charles Lewis Sur. ..... S. D. 4,503 ft.

W. S. Langford's No. 1 W. W. Whybark, 200 ft. from S and W of SW cor. of J. A. Dyer Sur. ..... S.D. 1,880 ft.

Lee Timberlake et al's No. 2 Julius N. Tidwell, 655 ft. from E and 2,510 ft. from S of survey in L. M. Rice Sur. ..... S.W. on drill stem test; S.D. 3,012 ft.

CHEROKEE COUNTY

Bridges and Candler's No. 1 Berryman, center of Berryman tract, H. Kimble Sur. ..... S.D. 1,000 ft.

Denman et al's No. 1 Mrs. Renfroe, 330 ft. N of S line and 330 ft. E of W line of farm, Uriah Moore Sur. ..... Derrick.

Wilson & Stubbs' No. 1 L. Robart, 450 ft. from S and 150 ft. from W of lease, J. B. Wolfin Sur. ..... S.D. 1,861 ft.

DALLAS COUNTY

Paris' No. 2 Wilkinson, 2,787 ft. from NW and 3,241 ft. from SW of John P. Anderson Sur. ..... T.D. 1,230 ft.; S.D.

Joe Wilson's No. 1 fee, 600 ft. from N line and 600 ft. from W line of 1,500-ac. tract, John Scroggs Sur. ..... Drlg. 125 ft.

DELTA COUNTY

Worthington et al's No. 1 Pejernett, 776 ft. from S and 150 ft. from W in E. Chick Sur., 1½ miles W of Horton ..... S.D. 3,315 ft.

ELLIS COUNTY

Clark Brooks' No. 1 C. W. Golliday, 300 ft. from S line and 300 ft. from E line of tract and survey, John Bones Sur. ..... T.D. 1,475 ft.

E. M. Roger's No. 1 John Lee Winn, 1,650 ft. from E and 150 ft. from S of Orland, Orlo Wheeler Sur. ..... S.D. 1,435 ft.

Worthen Pet. Co.'s No. 1 Cerf, 2½ miles NE of Ennis ..... S.D. 2,225 ft.

FRANKLIN COUNTY

Tom Harper's No. 1 fee, 150 ft. from N line and 200 ft. from E line of 116-ac. tract, W. M. Dawson Sur. ..... Derrick.

(Continued on Page 86)

May Mean Extension of Loving Pool

Ward County's Delaware Sand Well Good for From 75 to 200 Bbls.
Ten Locations Staked in Ranger District, Two in Panhandle

By L. E. Bredberg
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Nov. 23.—Shipley, Byrd and Harmon's No. 1 Lee Monroe, in Section 3, Block 1, W.&N.W. Survey, western Ward County, which picked up the Delaware sand two weeks ago, is now cleaning out after being given an 80-quart shot at noon of November 20, from 4,634-66 feet. The hole is standing with around 3,600 feet of oil, 2,500 feet of oil reported in the hole before the test was shot. It made two heads within an hour, heading about 12 hours after the shot, or near midnight, Friday, the two heads totaling nearly 75 bbls. of oil. It has made no heads since these two.

Gravity of the oil is 32.5, or 7.5 degrees below the gravity of the oil found in the Delaware sand pool in Loving County, 13 miles to the northwest. The well is estimated good for from 75 to 200 bbls. per day, or similar to the small high gravity, sweet oil producing wells in the Wheat Pool to the north. Papers carried the report that the well was good for from 700 to 1,000 bbls. per day, but this estimate was considered much too high. However, the small well proves another producing area for Ward County, which is a prolific oil-bearing county, although most of the wells are small, all the other pools producing sulphur oil, and located in the northern, southern and eastern parts of the county. This well also marks the first sweet oil, Delaware sand pool for the county, and may mean an extension of the Loving County Pool or prove a separate and distinct pool in the same trend.

The Burford Oil Co., which owns and operates a refinery at Pecos City, approximately 10 miles to the west of the Monroe test, also has a pipe line running from Winkler County to this refinery, within about 2 miles of the well, and may take the production. If such a connection is not made a line may be laid to the Texas & Pacific Railroad, 8 miles to the south.

Western Crane County

Southwest Oil Production Co. and Penn Oil Co.'s No. 1 Tubbs, in Section 3, Block B-27, western Crane County, is now drilling below 4,105 feet in lime after drilling plug at 3,027 feet where 8¼-inch casing was cemented. It is making around 4 bailers of sulphur water every four hours, believed to be coming from above. Water was struck in the Gulf Production Co. and Cranfill Brothers' No. 1 Tubbs, the discovery well to the south, around 3,800 feet, and the water in this latter test is believed to be coming from the same horizon.

Ector County

Weekly Oil Corp. and others' No. 1 Cowden, in Section 33, Block 43, Township 2s, T.&P. Survey, Ector County, went out of the salt at 2,535 feet making base of the salt plus 434. It topped the salt at 1,545 feet. Surface elevation of the test is 2,969 feet. This is the most interesting test in Ector County at the present time.

Howard County

Continental Oil Co.'s No. 6-A Settles, in the Howard County Pool, recently deepened from 2,220 feet to 2,442 feet, has increased from around 25 bbls. daily to 1,345 bbls. per day, gauged on a proration test. The well will be given a daily allowance of 420 bbls. The well is 2,220 feet from the north line and 2,513 feet from the west line of Section 6, Block 32, Township 2s, T.&P. Survey. The Cardinal Oil Co. previously recompleted its No. 1 Settles, approximately 900 feet to the southeast of the Continental well, increasing the production from around 50 to 450 bbls. per day. Previous total depth was 2,248 feet, and recompletion depth was 2,401 feet. The American Maracaibo Co. also recompleted its No. 1-A Settles, the 3-mile western extension of the Settles Pool. It also made a good comeback when deepened.

Deepening these wells, and proving the deeper pay to be much more prolific, will undoubtedly lead to all wells in this area being deepened in the future, especially those wells which are producing but a negligible amount of oil, hardly paying their daily producing costs. This field has many proven sands, the deeper proving exceedingly good producing strata, and worth testing by the old producers. Other companies are expected to follow suit in recompleting their many wells in the field.

RANGER AND NORTH CENTRAL TEXAS

There were 10 locations staked in the Ranger district during the week, 4 in Brown, 2 in Eastland, 2 in Stephens and 2 in Palo Pinto County. Two were staked in Archer and 2 in Wichita County, the latter counties being in the Wichita Falls district, showing a slackening of new activities in that district, compared with the three previous weeks, when an average of 20 locations were staked each week, Young, Archer and Wichita counties being the most active in the district.

M. M. Bradley has staked an interesting test on the Maxwell ranch, 3 miles southeast of Archer City, in Archer County. This is to be a Canyon test.

Deep Oil Development Co. and Lindsay Drilling Co.'s No. 1 Wilson, Lease 5-A in the Chalk Hill Pool, Archer County deep test, was to be abandoned at a total depth of 5,750 feet, where it has been standing shut down, but the Lindsay Drilling Co. is to take over the test and plug it back to around 3,638 feet and try to complete for a well at that depth, it having previously produced 50 bbls. oil per day on swab when tested at that depth. It encountered sand from 3,614-38 feet.

Deep Oil Development Co.'s No. 2-5-A Wilson, 100 feet west offset to the company's No. 1, is to be a twin well. It will be drilled to the Canyon pay at 2,200 feet, which was passed up in No. 1 on account of a deep well contract, although the well was estimated good for 80 to 100 bbls. at the 2,200-foot depth.

Deep Oil Development Co. Consolidated Oil Co. and Atlantic Oil Producing Co.'s No. 1 Wilson in Block 76, A. T. N. C. Survey, in the Chalk Hill Pool, Archer County, is shut down at 2,275 feet after missing the pay in top of the Canyon series. It may be deepened to 3,600 feet in an effort to pick up the still deeper pay.

PANHANDLE

There were two locations staked in the Panhandle district, one in Carson by the Texoma Natural Gas Co., which completed three gas producers in the county this week, and one in Gray County by the Skelly Oil Co.

The Railroad Commission's crew of men is still taking gauges in the Panhandle district to obtain a more accurate potential than the former figures of 110,000 bbls. per day, which has long stood as the district's daily potential. Daily average production in the district was 62,484 bbls. this week, an increase of 1,996 bbls. per day over the previous week.

The Phillips Petroleum Co. has taken over all of the Atlantic Oil Producing Co.'s leases in Gray County, including around 482 bbls. of production per day. In consideration Phillips traded some of its West Texas production. The Prairie Oil & Gas Co. owns a half interest in some of the leases involved and will retain its interest in that acreage.

WEST TEXAS PRODUCTION
Week Ending November 21

County—	No. wells	Prod.
Andrews	0	0
Crane	377	18,384
Crockett	51	1,057
Ector	78	6,402
Fisher	79	915
Garza	2	0
Howard-Glasscock	544	25,934
Irion	9	76
Jones	88	1,382
Loving	46	3,780
Mitchell	111	1,761
Pecos	551	67,283
Reagan	355	30,807
Runnels	5	58
Scurry	5	0
Upton	264	4,462
Taylor	263	59
Ward	76	3,818
Winkler	595	36,267
Total production this week		202,434
Total prouction last week		202,178
Increase		256

COMPLETIONS IN NORTH TEXAS

Archer County

Consolidated and Atlantic Oil & Production Co.'s No. 1 Wilson, dry and abandoned, total depth 2,303 feet. Deep Oil Development Co. and Lindsey's No. 1 Wilson, oil sand 2,196-2,212 feet, initial production 520 bbls., total depth 2,212 feet. Thomas Holcomb's No. 1 M. E. Chiles, dry and abandoned, total depth 660 feet. Cullum & Alexander's No. 1 Falls, dry and abandoned, total depth 1,206 feet. W. E. Maxson, Jr.'s No. 10 F. C. Green, oil sand 1,104-22½ feet, shot 60 quarts, initial production 32 bbls., total depth 1,123½ feet. W. E. Maxson, Jr.'s No. 11 F. C. Green, show oil 1,123-41 feet, shot 60 quarts, initial production 30 bbls., total depth 1,141 feet.

Perkins & Cullum's No. 2 Falls, dry and abandoned, total depth 1,120 feet. Schultz & Weaver's No. 5 F. C. Green, show oil 1,131-48 feet, shot 60 quarts, initial production 40 bbls., total depth 1,151 feet. Union Oil Co. and others' No. 5 J. A. Kunkel, oil sand 1,134-43

(Continued on Page 83)

WILDCAT OPERATIONS IN WEST TEXAS

Week Ending November 23

BREWSTER COUNTY

Company, well, farm name, section and block—	Remarks:
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F. Sur.	S.D. 1,935 ft.
E. L. Chapman's No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	S.D. 1,862 ft.
Trans-Pecos Oil & Gas Co.'s No. 1 Jones, 930 ft. from N and 2,500 ft. from E of Sec. 15, Blk. G-15, G.C.& S.F. Sur.	S.D. 2,900 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 miles south Alpine	S.D. 1,750 ft.

COCHRAN COUNTY

Penn Oil Co.'s No. 1 Myrick, C Labour No. 30 of League 128, Carson County School Lands	Drlg. 4,210 ft.

CONCHO COUNTY

Beasley et al's No. 1 Waring Estate, 400 ft. from N and E Sec. 163, T.&N.O. Sur.	S.D.
Turner et al's No. 1 Borsig, 150 ft. from S of NE cor. G. Emmig Sur. 139, 6 miles W of Paint Rock	S.D. 1,850 ft.

CRANE COUNTY

Southwest Oil Prod. Co. (Cranfill Bros.) and Penn Oil Co.'s No. 1 J. B. Tubb, 330 ft. from N and E of SW cor. of S 80 acres of NW cor. Sec. 3, Blk. B-27, P.S.L. Sur.	S.D. 4,060 ft.; waiting on cement to set; making 2 bailers of oil per day.

CROCKETT COUNTY

Doleman & Moore's No. 1 Ferner 2,135 ft. from N and 1,485 ft. from E of Sec. 36, Blk. 2, I.&G.N. Sur.	Spudded and S.D.

CULBERSON COUNTY

Kornrumpf et al's No. 1 Garren, 330 ft. S and W, Sec. 15, Blk. 79, Public School Land	S.D. 1,280 ft.

DAWSON COUNTY

Albaugh et al's No. 1 Robinson, C NW Sec. 46, Blk. M, E.L.&R.R. Sur.	To resume drilling.

(Continued on Page 85)

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ending November 23

CARSON COUNTY

Company, well, farm name, section and block—	Remarks:
Texoma's Nat. Gas Co.'s No. 1-T McCoy, 1,257 ft. N, 1,309 ft. E line, Sec. 41, Blk. 4	Bldg. rig.
Texhoma Natural Gas Co.'s No. 3 Schaffer, center NW. Sec 63, Blk. 4, I.&G.N. Sur.	Rigging up standard tools.
Texhoma Natural Gas Co.'s No. 1 Urbanczyk, center NE, Sec. 4, Blk. 4, I.&G.N. Sur.	Drlg. 1,310 ft.

CHILDRESS COUNTY

C. L. Sloan et al's No. 1 B. P. Smith, Sec. 49, F. P. Knott lands	T.D. 5,000 ft.

COLLINGSWORTH COUNTY

Dixon et al's No. 1 Bell, 330 ft. N, 1,320 ft. W, Sec. 102, Blk. 21, H.&G.N. Sur.	S.D. 2,508 ft.
Downey et al's No. 1 Beasly, SE cor. SW SE, Sec. 95, Blk. 15, H.&G.N. Sur.	Rigged up.

DEAF SMITH COUNTY

Western Union Oil Co.'s No. 1 Farwell, center NW, Sec. 18-3n-2e	Rigging up standard tools.

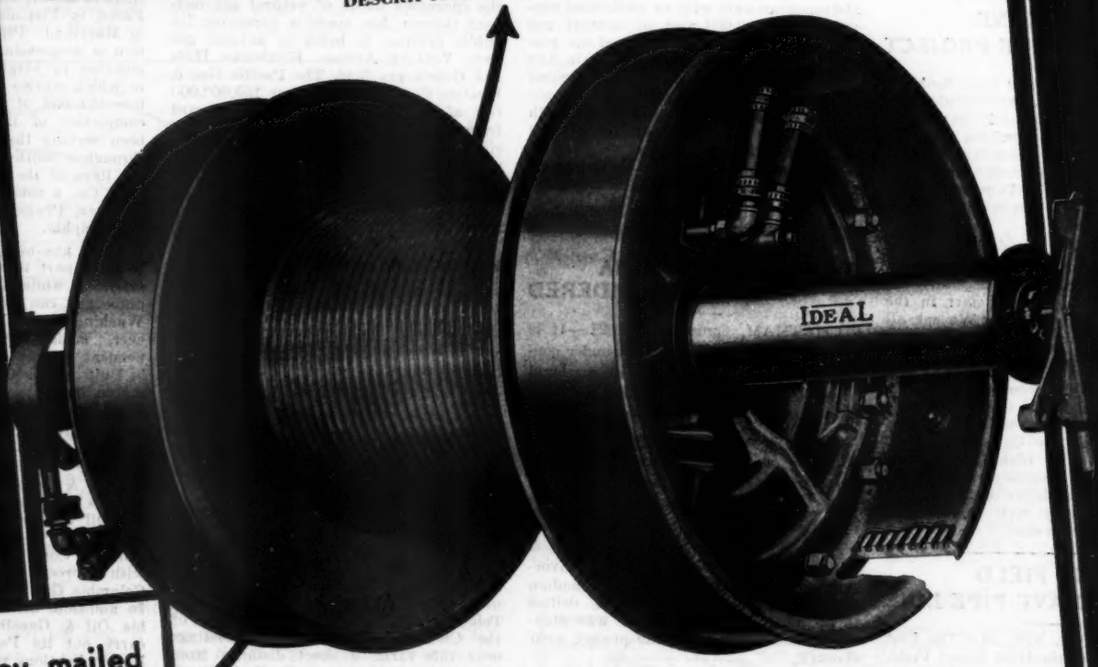
GRAY COUNTY

Anderson et al's No. 2 Vollmert, 330 ft. N and W, SW, Sec. 140, Blk. 3, I.&G.N. Sur.	Standardizing 2,570 ft.
Back & Barber's No. 1 Back, 660 ft. from S and 330 ft. from W. Sec. 140, Blk. 25, H.&G.N. Sur.	S.D.
Boyes et al's No. 1 Colebank-Morse, 330 ft. NE, Sec. 65, Blk. 25, H.&G.N. Sur.	Spudded and S.D.
Brown et al's No. 1 Duncan, 330 ft. S and E, NW, Sec. 93, Blk. 3, I.&G.N. Sur.	S.D. 2,650 ft.
Dixon Creek Oil Co.'s No. 2 Horner, 330 ft. from N and E of Sec. 139, Blk. 3, I.&G.N. Sur.	Drlg. 1,810 ft.
Parton Holt and Shell Pet. Corp.'s No. 1 Morse, 330 ft. S and E, Sec. 6, Blk. 24, H.&G.N. Sur.	Top gas 2,075 ft; drlg 2,365 ft.
Jean Pet. Co.'s No. 1 Furneaux Bros., 330 ft. N and W, cor. SE, Sec. 200, Blk. B-2, H.&G.N. Sur.	Fishing 3,010 ft.

(Continued on Page 86)

IDEAL
WATER COOLED
BRAKE RIMS
FOR
IDEAL DRAW WORKS

DESCRIPTIVE BULLETIN No. 31A



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THE NATIONAL SUPPLY COMPANIES

Pipe Line Construction News

New York State Gas Lines May Extend to Albany and Eastward

NEW YORK, Nov. 21.—As a result of negotiations between the Niagara Hudson Power Corp. and leading natural gas interests in New York and Pennsylvania it is expected that natural gas will soon be available for a group of up-state cities, including Albany. Some New England territory will also be embraced by the projects, it is expected.

Well informed sources declare that after the pipe line from the Tioga Field in Pennsylvania to the city gate of Syracuse is completed work on another line eastward to Albany will begin. This will take place early in the spring.

An agreement has already been reached as to the sale price that the Lycoming Natural Gas Co. will receive from Niagara Hudson Power Corp. for the gas, it is understood. Lycoming is a Standard Oil Co. of New Jersey subsidiary.

Construction work on the 100-mile pipe line from the Tioga Field to the city gate of Syracuse has been resumed, after several weeks of suspension pending completion of details between Lycoming and Niagara-Hudson Power. The line is to be owned by a subsidiary of Lycoming

(Continued on Page 101)

MONTANA-SPOKANE PIPE LINE PROJECT

United Press dispatches from Spokane, Wash., state that a $15,000,000 pipe line project to bring natural gas from Montana fields across northern Idaho to Spokane would reach maturity in 1933, according to an announcement made by associates of Jerome K. Drumheller. The line eventually will reach the Pacific Coast, it is planned.

Mr. Drumheller has asked the Idaho public utilities commission for a certificate of convenience and necessity to permit the construction to start in the spring of 1932. He added, "We ask all of 1931 to make surveys, secure franchises and purchase rights of way in order to be able to build early in 1932."

The proposed line would extend from the Cut Bank Field in Glacier County, Montana, and might possibly tap gas fields just across the Canadian border. The line would enter Idaho just east of Burke and extend generally westward to Spokane. Mr. Drumheller and associates drilled the discovery well in the Cut Bank Field two years ago.

HIGH ISLAND FIELD WILL HAVE PIPE LINE

HOUSTON, Tex., Nov. 23.—The first pipe line outlet for the High Island Field, southern Galveston County, is to be provided with the laying by Yount Lee Oil Co. of approximately 45 miles of 10-inch pipe from the field to the company's tank farm at Spindletop, south of Beaumont. Pipe already is being moved in and actual laying of pipe will begin within the next few days.

High Island, a salt dome field, is owned by Yount Lee Oil Co., which purchased the entire holdings of Marrs McLean and the Gulf Production Co. in a deal completed last April. The field, located almost on the beach, has been productive since 1922 but all oil to date has been moved out by tank car. Until recently, development at High Island has not resulted in any large production but lately several good wells in a deep sand have been brought in materially boosting the field's potential.

SOUTHERN FUEL CO.'S LINE NOW READY FOR SERVICE

Bell hole welders on Southern Fuel Co. Kettleman-Long Beach 26-inch line.

LOS ANGELES, Calif., Nov. 21.—The Southern Fuel Co. has just finished its new gas line from Kettleman Hills to Los Angeles and this transmission system should go into active service within the next few days, as final pressure tests have just about been completed. This new 225-mile line will provide the Los Angeles Metropolitan area with an additional supply of 130,000,000 feet of natural gas per day. Its completion removed the possibility of a natural gas shortage in Los Angeles Basin during the approaching winter season. The Southern California territory has not been threatened with any shortage of natural gas for heating purposes, although it appeared possible for a time that some of the commercial consumers might have found it necessary to switch over to fuel oil. This is particularly true of the Southern California Edison plant which consumes approximately 90,000,000 feet of natural gas per day in the generation of electric current. This plant is so equipped that it could be turned over to fuel oil within a very short time. Decreased drilling in Los Angeles Basin fields, in contrast with previous town lot drilling campaigns and the enormous waste of natural gas incident thereto, has made it necessary for public utilities to bring in natural gas from Ventura Avenue, Kettleman Hills and Goleta gas field. The Pacific Gas & Electric Co. is moving about 150,000,000 feet of natural gas per day northward from Kettleman Hills to the San Francisco Bay region, in addition to approximately 100,000,000 feet coming southward to Los Angeles through other transmission systems.

PIPE LINE TO REGINA IS STILL CONSIDERED

CHATHAM, Ontario, Nov. 21.—It is understood that plans are still under consideration for the proposed international pipe line to be constructed from the Bowdoin gas field in northern Montana to Regina, Saskatchewan. The Power Corporation of Canada, whose application for a franchise was tentatively approved by the Regina city council, has deferred the submission of the proposal to a popular vote; but it is understood the question will be reopened at a more favorable time. In anticipation of the Canadian franchise the Bowdoin Gas Co. drilled three wells this summer and was planning additional work if the project went through.

In the meantime, A. R. Jones, Mid-Continent natural gas operator, and allied interests, are reported to be backing efforts of Regina men to develop a natural gas supply in southern Saskatchewan.

GENESEO TO ROCKFORD BIDS ARE RECEIVED

CHICAGO, Nov. 23.—Bids were received today by Continental Construction Co. for the laying of a 20-inch gas line from Geneseo to Rockford, Ill., a distance of 86 miles, and the award is expected to be made this week. Probable cost is figured at around $20,000 per mile. Pipe for the project will be purchased in 10 days.

WORK ON 20-INCH GAS LINE FROM TIOGA AREA

CORNING, N. Y., Nov. 21.—Construction of a section of the 20-inch Lycoming Natural Gas Co.'s gas supply line, northeast from the Tioga Field toward Syracuse, started near this city Monday morning, according to an announcement today by J. French Robinson, manager of the Lycoming Natural Gas Co., Wellsboro, Pa., offices.

Present plans are to have six construction gangs working at various places along the line from the shutdown point on the New York-Pennsylvania State border to Syracuse. One of these gangs is scheduled to start Monday on the Frank Tobey farm, East Corning Road, north of the Chemung River. River crossings near this farm, a short distance from Three Mile Bridge, were finished recently. The line will pass East Corning and proceed eastward north of Big Flats toward Horseheads and there turn north toward Ithaca. Experienced pipe line construction men will handle the work. The line will carry Tioga Field gas to Syracuse for Standard Oil of New Jersey through the subsidiary Lycoming company.

Construction of the line has progressed considerably in the past few days. The ditch for the 20-inch pipe has been dug from Lawrenceville, Pa., nearly to Lindley and pipe has been strung past Lindley to another river crossing. Several weeks ago the line work was shut down on the New York-Pennsylvania State line near Lawrenceville and the renewal of activities will be under the six gang plan outlined.

TEXAS AND EASTERN GAS UNITED FOR FIRST TIME

PITTSBURGH, Pa., Nov. 23.—The great natural gas fields of Texas and the older producing fields of the Appalachian region have been definitely linked together for the first time. An engineering feat hardly conceded possible a few years ago became an actuality when the natural gas line of the Indiana Gas Transmission Co. was completed. At the Illinois-Indiana state boundary, the Indiana Gas Transmission Co.'s line is tied to the eastern terminus of the Panhandle Eastern Pipe Line Co., while at the Indiana-Ohio boundary it is tied to the Columbia Gas & Electric system.

Natural gas from the prolific fields of Texas is carried hundreds of miles to augment the supply for the Columbia Gas & Electric system now coming chiefly from Ohio, West Virginia and Pennsylvania fields.

In the meantime, the Columbia Gas & Electric's new major line system from eastern Kentucky, through southern West Virginia and Virginia to Washington also has been completed and gas is now moving northeastward from Kentucky to the nation's capital. This line is now supplying natural gas to the Washington(D. C.) Gas Light Co. and to the cities of Lexington, Covington and Clifton Forge, in Virginia, and Harford County in Maryland. Piping for retail distribution is progressing rapidly in other communities in Virginia and West Virginia in which service will be inaugurated before the end of the year. Prior to the completion of this line, Columbia had been serving the utility in Washington through a southwestward extension from the lines of the Manufacturers Light & Heat Co., a subsidiary, which run across southern Pennsylvania to a point near Philadelphia.

Texas gas now can be utilized in the western part of Columbia's distributing territory, while Kentucky and West Virginia gas can be used for the line to Washington and beyond. Columbia, however, made arrangements with independent sources of supply, one of which is United Carbon, for gas for the Washington line.

The Panhandle Eastern Pipe Line Co. is an indirect subsidiary of Columbia Gas & Electric. The stock of Panhandle Eastern Pipe Line is held equally by Columbia Oil & Gasoline Corp. and Missouri-Kansas Pipe Line Co., although Columbia Oil & Gasoline Corp. has working control. All the stock of Columbia Oil & Gasoline Corp. is held in a voting trust, with interests dominant in the affairs of Columbia Gas & Electric as the trustees. In addition, all the advances to Columbia Oil & Gasoline Corp. necessary to carry out its Panhandle Eastern Pipe Line obligations were made by Columbia Gas & Electric.

GREASEWOOD LINE UNDER WAY

DENVER, Colo., Nov. 23.—The Continental Oil Co.'s 4-inch line, 16 miles long, from Greasewood to Hardin, on the Union Pacific Railroad, is under construction. The Gordon Construction Co. of Denver has the contract. A loading rack with a capacity of 15 cars is being constructed at Hardin. The Public Utilities Commission has granted the company more time in which to build the line on into Denver. The pumping station will be near the company's No. 1 Briggs. Natural gas will be used for fuel and the pipe will be covered to a depth of 4 feet. A 5,000-bbl. storage tank is being moved to Hardin.

Volumetric Efficiency in Pumping

Methods for Estimating Actual Plunger Stroke, Including Formulas and Tables of Coefficients. Potential Savings

By Hallan N. Marsh
General Petroleum Corp., Los Angeles, Calif.[1*]

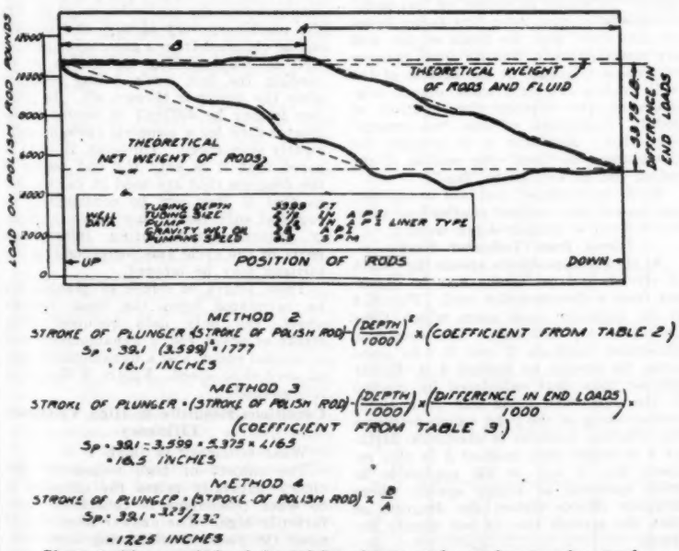
GREAT ECONOMIES EFFECTED DESCRIBED

Volumetric efficiency as applied to oil well pumping is defined, and the great economies accompanying high volumetric efficiency are described. Formulas and constants for calculation of volumetric efficiency are presented, with special discussion of determination of gross production and actual plunger stroke. Five methods for estimating the latter are presented, including formulas and tables of coefficients. The conditions requisite to high volumetric efficiency are enumerated and means of meeting them described. Various methods of reducing pumping speed are discussed, some of which are applicable to present rigs at small cost. The practical results of attaining high volumetric efficiency are illustrated, with a few typical cases from extensive recent experience. Advantages include increased production rate in some cases, and drastic reductions of operating cost without sacrifice of production rate in practically all cases. Economies effected include power savings of as much as 80 per cent, and similar reductions of material and labor costs.

Recent extensive experience proves that it is not only possible but practical to attain high volumetric efficiency in pumping wells of all classes—dep or shallow, small or large, and with thick or thin oil. The attaining of good volumetric efficiency is resulting in startling economies by reducing power consumption as much as 82 per cent, and largely eliminating pump, rod, and rig maintenance. These economies are secured without sacrifice of production rate. These improvements are not the result of any radical discovery, but merely of the systematic application of principles most of which have been more or less experimented with and written about but not generally applied.

Efficiency in general is the ratio between effect and cause, or result and effort. Volumetric efficiency, specifically, is the ratio between volume of liquid pumped and pump displacement. Efficiency is an over-worked, often misused, and, therefore, generally disliked term; but if properly used, is not only definite and convenient, but practically indispensable in evaluating pumping operation and formulating recommendations leading to improved results. Efficiency figures should be considered as tools rather than as objectives.

Having determined the volumetric efficiency of a pumping installation, the possibilities for improved results are definitely limited and indicated. If the efficiency is very nearly 100 per cent, it is obviously futile either to expect increased production by experimenting with a different pump of the same capacity or to expect to effect economies by reducing pump capacity without sacrificing rate of production; but the possibility of increasing production by increasing displacement is indicated. On the contrary, a volumetric efficiency substantially less than 100 per cent calls for a critical investigation of tubing leakage, pump slippage, and gas-anchor ineffectiveness. If trouble is found here, its elimination may lead to increased production rate. If it is found by tests that leakage and slippage are negligible, as they should be, and that the gas anchor is adequate, then the clearly indicated course is to reduce displacement and thereby reduce operating expenses.



METHOD 2

STROKE OF PLUNGER = (STROKE OF POLISH ROD) − $\left(\frac{\text{DEPTH}}{1000}\right)^2$ × (COEFFICIENT FROM TABLE 2)

S_p = 38.1 (3.599)² × .1777

= 16.1 INCHES

METHOD 3

STROKE OF PLUNGER = (STROKE OF POLISH ROD) − $\left(\frac{\text{DEPTH}}{1000}\right)$ × $\left(\frac{\text{DIFFERENCE IN END LOADS}}{1000}\right)$ × (COEFFICIENT FROM TABLE 3)

S_p = 38.1 − 3.599 × 5.375 × 4.165

= 16.5 INCHES

METHOD 4

STROKE OF PLUNGER = (STROKE OF POLISH ROD) × $\frac{B}{A}$

S_p = 38.1 × $\frac{429}{1232}$

= 13.25 INCHES

Figure 1—Three methods of determining plunger stroke at slow pumping speed.

Determination of Volumetric Efficiency

Gross Production—Since volumetric efficiency is the ratio of gross volume of liquid pumped to pump displacement, it becomes necessary to determine these two quantities separately. Net oil production for each lease is, of course, accurately gauged at the shipping tanks for accounting purposes (in accordance with A.P.I. Code No. 25, 2nd edition), and gross production (oil plus water) is supposedly known; but in some cases the latter data are not accurate enough for present purposes. For example, in some cases the production is gauged only by leases or groups of wells and credited to the various wells by estimate. In other cases production of individual wells is gauged occasionally and assumed to remain constant between gaugings. In other cases water is drained from production tanks and its volume either estimated or disregarded as unimportant and not reported. Still another factor which sometimes makes gross production data unreliable is the presence of gas in the oil or froth on the surface at the well tanks, which makes the measured volume of fluid greater than the actual volume of liquid. In such cases correct determination of liquid volume can only be made by long settling and gauging, as in shipping tanks, or by weighing. If the specific gravity of the gas-free liquid is known, the volume can be computed from the weight. All of these possibilities must be investigated in the field before using ordinary gross production data as a basis for volumetric efficiency calculations. In many cases knowledge of the individual well gauging practice will justify using available data on gross production, but sometimes change in the gauging practice, or even acquisition of additional gauging or weighing equipment, may be necessary.

Displacement

Oil well pump displacement in barrels per day equals plunger stroke in inches, times strokes per minute, times a coefficient depending on the diameter of the plunger. This can be expressed by the following formula:

$$D = S'' \times \overline{SPM} \times K$$

Where D = displacement in 42-gallon barrels per 24-hour day.
S" = strokes in inches.
$\overline{SPM}$ = number of strokes per min.
K = coefficient.

The coefficient is equal to the area of the plunger in square inches (do not deduct rod area), times the number of minutes in 24 hours, divided by the number of cubic inches in a barrel. Table 1 shows coefficients corresponding to plunger diameters in common use.

The above formula applies to all pumps known to be in actual use. A double-acting pump might be designed that would have greater capacity, but would probably not be practical because sucker rods must work primarily in tension, and double acting pumps would require that the rods push and pull alternately. In this connection it is interesting to note that ordinary pumps are to a certain extent double-acting, as a volume of fluid equal to the area of the polish rod times the length of the stroke is displaced from the tubing on each down-stroke. In the very small diameter pumps coming into use this consideration is important, because the diameter of the plunger may be actually less than the diameter of the polish rod. This, however, is properly accounted for in the formula by not deducting the area of the rods from the plunger area.

TABLE 1

Pump Nominal size and type	Actual plunger diameter (inches)	Coefficient
A.P.I. cast iron liner		
2 in.	1.750	0.357
2½ in.	2.250	0.590
3 in.	2.750	0.882
A.P.I. regular cold-drawn barrel		
2 in.	1.781	0.370
2½ in.	2.250	0.590
3 in.	2.750	0.882
A.P.I. regular inserted		
2 in.	1.500	0.262
2½ in.	1.781	0.370
3 in.	2.250	0.590

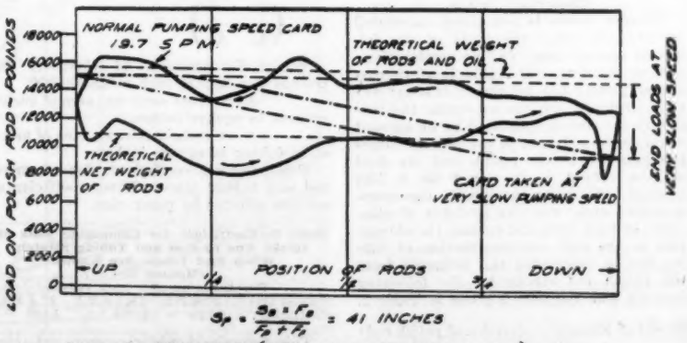
Apparent Volumetric Efficiency

In the foregoing formula, number of strokes per minute can be easily and accurately measured with a stop watch, and diameter of plunger is accurately known. Length of stroke of plunger, however, is more difficult to determine. In the absence of information as to length of plunger stroke, volumetric efficiency has often been calculated upon the basis of polish rod stroke. Due to elasticity of sucker rods, plunger stroke (in all but the shallowest wells) is not often even approximately equal to polish rod stroke. Where plunger stroke is not known so that volumetric efficiency can only be based on polish rod stroke, it is recommended that the term "apparent volumetric efficiency" be used. Data as to apparent volumetric efficiency may be of some value if their significance and limitations are understood, but are apt to be very misleading.

Actual Plunger Stroke

Several methods have been proposed and used for determining the actual length of plunger stroke. None of these is entirely accurate and reliable, but intelligent application of the most suitable method or combination of methods should lead to a reasonably accurate estimate.

Barrel Wear—Perhaps the most direct and obvious means of determining actual plunger stroke is to measure the length over which wear has occurred in the



$S_p = \frac{S_0 \times f_0}{f_0 + f_1}$ = 41 INCHES

S_0 = 34.23 INCHES (MEASURED AT POLISH ROD)

f_0 = 4030 POUNDS = MEAN EFFECTIVE FORCE OF HIGH SPEED CARD (SECURED WITH AID OF PLANIMETER)

$f_0 + f_1$ = 5333 POUNDS = DIFFERENCE OF END LOADS OF CARD TAKEN AT VERY SLOW PUMPING SPEED

Figure 2—Determination of plunger stroke by conservation of energy method.

[1]Assisted by Bruce H. Robinson and Douglas G. Kingman, General Petroleum Corp., Los Angeles, Calif.

[*]Before division of production, American Petroleum Institute, Dallas, Tex.

pump barrel after it is removed from the hole. In most cases, especially with the smaller and longer pumps, this necessitates splitting the barrel. Length of stroke is taken as length of wear minus total length of steel plunger, or distance between end cups, if cups are used. A modification of this method consists of inserting in, or attaching to, the plunger a hard, sharp point which scratches the inside of the barrel, and perhaps makes a more definite indication than natural wear. In this case the length of stroke is taken as the length of the scratch.

This method has serious limitations, and is apt to be misleading, but is useful as a check on other methods. The trouble is that both length of stroke and average position of plunger vary from time to time. When the rods are first run into a well, they are at atmospheric temperature, but gradually approach the subsurface temperature as oil from the formation is pumped into and through the tubing. A difference of temperature of only 50 degrees will cause the length of a 4,000-foot string of rods to change 16 inches. If appreciable wear of the barrel takes place before the temperature reaches equilibrium, the worn length of the barrel will be greater than the length of any one stroke. In the case of an 8,000-foot well having an average temperature of 150 degrees, and with an atmospheric temperature of 50 degrees, the error due to temperature alone might be as much as 64 inches.

Changing Loads

Changing loads on the plunger due to increasing fluid level in the tubing and decreasing fluid level in the casing may also make large errors. For example, assume a 4,500-foot well, with a 2-inch tubing, pumping 20° A.P.I. liquid. It can be computed (see Method 2) that while the length of plunger stroke with tubing empty is the same as the polish rod stroke, 40 inches, the net stroke after the tubing is filled will be only 21.8 inches. As this decrease of stroke will be gradual, it is apt to be impossible to distinguish the wear representing normal stroke from that representing original stroke. Moreover, in some cases the increased sucker rod stretch at the end of the up-stroke, due to the tubing being full, may be less than the increased stretch of the tubing, so that the plunger will be working higher in the barrel. Thus, wear due to normal stroke with full tubing will extend beyond the wear due to greater stroke with empty tubing, and the error will be increased by the amount of this extension. This latter situation occurs in the case of small diameter pumps with large tubing. It may be calculated theoretically, and its existence has been indicated by inserted pumps becoming unseated by the pump "bumping up" as the tubing becomes filled.

Any one of the three errors mentioned above may be sufficient entirely to invalidate this method when used by itself. However, it is to be noted that while the net stroke thus determined may be much longer than the actual stroke, it can never be shorter. Thus, this method establishes a maximum limit which may be useful as a check on other methods.

Theoretical Static

Plunger stroke is sometimes calculated theoretically upon the basis of the following assumptions: (a) no acceleration; (b) no friction; (c) liquid level in casing at pump; (d) no gas in tubing; (e) rods straight. On the up-stroke the tension in the rods is increased by an amount equal to the net area of the plunger times the pressure at the pump, and the load on the tubing is decreased by a like amount. Knowing the length, the cross-sectional area, and the modulus of elasticity of both rods and tubing, the elongation in the rods and contraction of tubing can be calculated and deducted from the polish rod stroke by the following formula and coefficients given in Table 2.

$$\text{Stroke of plunger} = (\text{stroke of polish rod}) - \left(\frac{\text{depth}}{1{,}000}\right)^2 \times \text{coefficient.}$$

Similar coefficients can be computed for other size pumps, rods, etc., by the use of the following formula (upon which Table 2 is based):

TABLE 2—COEFFICIENTS FOR COMPUTING THEORETICAL LOSS OF STROKE DUE TO ROD AND TUBING STRETCH BY METHOD 2

Gravity of fluid (degrees A.P.I.)	Three-fourths inch rods and negligible acceleration: 2-in. tubing, 1½ in. diameter pump	2-in. tubing, 1⅝ in. diameter pump	2½-in. tubing, 1 25/32 in. diameter pump	2½-in. tubing, 1 15/16 in. diameter pump	3-in. tubing, 2¼ in. diameter pump	3-in. tubing, 2⅜ in. diameter pump	3-in. tubing, 2 7/16 in. diameter pump	3-in. tubing, 2⅝ in. diameter pump
10	0.958	1.305	1.255	1.486	2.004	1.886	2.213	2.817
12	0.945	1.287	1.238	1.466	1.976	1.860	2.183	2.779
14	0.932	1.269	1.221	1.445	1.949	1.834	2.153	2.740
16	0.919	1.251	1.204	1.425	1.922	1.809	2.123	2.702
18	0.907	1.235	1.188	1.406	1.897	1.785	2.095	2.666
20	0.895	1.218	1.172	1.388	1.871	1.761	2.067	2.631
22	0.883	1.202	1.157	1.369	1.846	1.737	2.039	2.595
24	0.872	1.187	1.142	1.351	1.822	1.715	2.013	2.562
26	0.861	1.172	1.128	1.335	1.801	1.695	1.989	2.531
28	0.850	1.157	1.113	1.318	1.777	1.672	1.963	2.498
30	0.840	1.143	1.100	1.302	1.755	1.652	1.939	2.468
32	0.829	1.129	1.086	1.286	1.734	1.632	1.916	2.437
34	0.820	1.116	1.074	1.271	1.714	1.613	1.893	2.409
36	0.809	1.102	1.060	1.255	1.692	1.592	1.869	2.379
38	0.800	1.089	1.048	1.240	1.672	1.574	1.847	2.351
40	0.791	1.077	1.036	1.226	1.654	1.557	1.827	2.325
42	0.782	1.064	1.024	1.212	1.634	1.538	1.805	2.297
44	0.773	1.052	1.012	1.198	1.616	1.521	1.785	2.272
46	0.764	1.040	1.001	1.185	1.598	1.504	1.765	2.246
48	0.756	1.029	0.990	1.171	1.580	1.487	1.746	2.221
50	0.747	1.017	0.978	1.158	1.562	1.470	1.725	2.195

$$\text{Coefficient} = \frac{12 \times 1{,}000^2 \times A_p \times P_p}{E\left[\frac{1}{A_r} + \frac{1}{A_t}\right]}$$

Where A_p = total area plunger in square inches.

P_p = pressure in pounds per square inch per foot at pump.

A_r = cross-sectional area rods in square inches.

A_t = cross-sectional area of metal in tubing in square inches.

E = modulus of elasticity in lbs. per square in. = 29,000,000.

The assumptions upon which this formula is based should be noted. Under ordinary conditions it may be far from correct. At speeds less than 10 strokes per minute, acceleration is more or less negligible; but at more common pumping speeds of 20 to 25 strokes per minute, results from this formula are worse than useless, as acceleration will cause the plunger to tend to overshoot so that its travel will approach, and in some cases greatly exceed, the polish rod travel. Friction either between rods and tubing or between tubing and casing will obviously alter results, the former tending to shorten the net stroke and the latter to lengthen it. Either gas in tubing or high fluid level will reduce the variation of load and increase stroke. Kinked or corkscrewed rods act as springs, and have an apparent modulus of elasticity much less than that of straight rods.

End Loads

With the aid of dynamometer data, the net stroke may be calculated from the following formula:

(Stroke of plunger) = (stroke of polish rod) — (depth in thousands of feet × coefficient × [(load at end of upstroke)/1,000 − (load at end of downstroke)/1,000] (length of strokes in inches and loads in pounds).

The coefficient represents elasticity of both rods and tubing and equals $\frac{12 \times 1{,}000^2}{E} \times \left(\frac{1}{A_r} + \frac{1}{A_t}\right)$

Where E = modulus of elasticity in pounds per square inch = 29,000,000.

A_r = cross-sectional area of sucker rods in square inches.

A_t = cross-sectional area of metal in tubing in square inches.

Following are coefficients for common rod and tubing sizes. These coefficients are not affected by pump size.

Table 3—Coefficient for Computing Loss of Stroke Due to Rod and Tubing Stretch When End Loads Are Known (Method 3)

For three-quarter-inch rods

Tubing size	2" A.P.I.	2½" A.P.I.	3" A.P.I.
Coefficient	1.254	1.165	1.096

This formula should give more reliable results than the previous one, because it does not depend upon any assumption as to acceleration, liquid level in casing, or gas in tubing. However, results may be somewhat in error due to friction between rods and tubing which would result in a calculated loss of stroke being greater than the actual loss, as the frictional component of the change of force is not effective in producing stretch throughout the whole length of the rods and tubing. Inertia of rods and oil is assumed as concentrated at the plunger, whereas the inertia of the rods is distributed. Therefore, any change of force measured at the surface is not necessarily accompanied by the same change of force, all the way to the pump, as part of it may be used up in accelerating the intervening rods. At higher speeds this error alone may invalidate the method.

Moreover, at any considerable speed, the time required for variation of stress to travel from the pump to the dynamometer is appreciable; and as considerable variation of tension generally occurs near both ends of the stroke, considerable error may result from ignoring this time factor. The velocity of travel of a tension wave in steel is 17,200 feet per second. If sucker rods are straight, this value applies. If they are only slightly kinked or corkscrewed, the value is greatly reduced. Attempts to correct or "set-back" dynamometer cards by a time factor based on this speed and the depth of the well are unsatisfactory, because some changes of tension originate at the bottom of the well (valves closing), while others originate at the surface (acceleration of rods). Correction of one "uncorrects" the other. Moreover it is possible for the plunger to "lead" the motion of the polish rod as well as to "lag."

Such "corrections" had best be omitted, and use of this method confined to moderate speed or shallow-depth wells.

Direct from Indicator Card

At slow and moderate speeds the length of stretch and net stroke may be apparent from a dynamometer card. Figure 1 is an indicator card upon which these quantities are indicated. This card also illustrates methods 2 and 3. In some cases the stretch by method 4 is slightly greater than that calculated by method 3, the difference being due to a slight corkscrewing of the rods, which decreases the effective modulus of elasticity. Method 4 is better than method 3 in this respect, but is not at all applicable to wells operated at higher speeds where dynamic effects distort the diagram so that the stretch line is not clearly defined.

Conservation of Energy

Probably the best method now in use for calculating net stroke in any but very slow-speed operations is the following, based upon the principle of conservation of energy:

If there is no friction in the well between the well end of the walking beam and the plunger, the work per cycle at the plunger must equal the work per cycle at the beam (from the principle of the conservation of energy). This relation may be expressed:

$F_b \times S_b = F_p \times S_p$, where

F_b = mean effective force measured at beam.*

S_b = length of stroke measured at beam.

F_p = mean effective force at plunger.*

S_p = length of stroke at plunger.

*The term "mean effective force" is used in a special sense analogous to that in which the well known term "mean effective pressure" is used in analyzing engine or pump indicator cards.

The above relation holds whether F_p be useful work only or if it includes plunger friction. Practically, there is a considerable amount of friction between rods and tubing, and rods and oil. This friction F_f is distributed unequally along the depth of the well, but is probably for the most part near the bottom of the well where holes are commonly the most crooked. If we assume it to be concentrated at the plunger, the distance through which it acts equals the plunger stroke S_p. Note that this rod friction force must act through a distance between S_b and S_p, and presumably nearer to the latter. Moreover, the value of F_f is ordinarily small compared with F_p, so that a small error in the assumption of the distance through which it acts has a still smaller effect on the final results. Ordinarily no serious error will be introduced by this assumption. Therefore, we may safely say that:

$F_b \times S_b = (F_p + F_f) \times S_p$, which can be written

$$S_p = \frac{F_b \times S_b}{F_p + F_f}$$

F_b and S_b can be easily and quite accurately measured F_p plus F_f can be measured by the maximum (not mean) effective force at the beam, while pumping at such a slow speed that acceleration is negligible, such measurement to be made immediately after normal speed operation so that fluid level and amount of gas in tubing will not have time to change. Under these conditions we should get an indicator card of roughly parallelogram form with horizontal top and bottom and sloping ends, the latter due to increase of rod stretch at the beginning of the upstroke, and decrease of rod stretch at the beginning of the downstroke. F_p plus F_f will be the perpendicular distance between top and bottom lines of this card.

Slow-Speed Card

A slow-speed card can be secured from an electric or steam-pumped well by manipulating the controller so as to turn the machinery very slowly, and perhaps can be obtained from a gas engine-pumped well by manipulating the clutch or recording the last cycle before stopping after the power is thrown off. In practice it may be difficult to secure an indicator card for a complete cycle at sufficiently slow speed. However, it is to be noted that it is only the end points of the diagram that are used in calculation, so that if they can be consistently secured at sufficiently slow speed, a slightly greater speed during intermediate parts of the cycle and corresponding distortions may be ignored.

Thus, length of stroke of plunger can be calculated from the final formula above, the only data required being stroke of polish rod, a dynamometer card at normal speed, and a dynamometer card at very slow speed. Figure 2 illustrates this method.

Conditions Requisite to High Volumetric Efficiency

What efficiency is "high"?

The subject of high volumetric efficiency naturally raises the question as to what percentage is considered satisfactorily high. The answer must depend upon the class of well being considered, but it appears from recent experience that actual volumetric efficiencies less than 50 per cent are rarely excusable, even under unfavorable conditions, and that under average conditions 70 and 80 per cent should be secured. Still higher values can be secured, but are not considered advisable, because without a moderate margin of displacement a small amount of pump wear will result in loss of production. A certain amount of pump slippage is inevitable; and as the amount of slippage is independent of the amount of oil pumped, its percentage effect will be greater on small wells than large wells. Likewise, leakage will be greater in deep wells than shallow wells. In extremely thick oils complete elimination of gas may be impractical, and for the present some loss of efficiency may have to be allowed for this cause. The figures mentioned certainly deserve to be called high as compared with those observed in the past and in much present practice.

High volumetric efficiency, as above defined, will be secured if the following

conditions are met; a, tubing leakage and unnecessary pump slippage eliminated; b, gas excluded from the pump while oil freely admitted, by the use of an adequate gas anchor; and c, displacement of the pump suited to be desired or potential production of the well. These points will be treated in more detail one at a time.

Leakage and Slippage

Tubing leaks, while perhaps not common, sometimes exist and go unnoticed, especially when the pump is operated with a great excess of displacement. If there is any cause of doubt, tubing should be thoroughly tested by filling with water while in the hole or steaming in stands in the derrick. Pumps may be individually tested for slippage aboveground by connecting at the top to a source of high pressure fluid and measuring the flow of fluid out of the bottom with the standing valve removed or held open. However, sufficient test data are available, so that slippage of liner-type pumps can be approximately predicted from their fit and condition. Figure 3 presents data as to the amount of slippage through A.P.I. cast-iron liner working-barrel pumps, with steel plungers of various fits and with various grades of oil. It will be noticed that leakage is less than 5 bbls. per day under most conditions. The curves shown only cover the ordinary range, other data not being shown—either because the leakage rates were excessive or were to small to plot, but form a basis upon which rate of leakage may be estimated for other conditions.

It appears probable that leakage through pump valves is a more common source of excessive loss than slippage past plungers. Leakage of valves in good condition is negligible, but leakage through moderately worn valves is excessive. Condition of valves can be determined by common methods of inspection.

Gas Anchor

A more important factor is gas. Pumping of gas takes power and uses up displacement that should be used to pump oil, but is unnecessary as gas will flow out through the casing, if given a chance, by the use of an effective gas anchor and small casing pressure. Many wells are operated without any anchor, and the most apparent reason for this is that many of the anchors tried have been so poorly designed as to be perhaps more of a hindrance than a help. The purpose of the gas anchor is to admit oil to the pump freely, while excluding gas as completely as possible. Free admission of oil requires short passages of large cross-sectional areas without orifices or other special restrictions. The only known principle of separating gas from oil that is applicable to this situation is gravity separation. Gas being lighter than oil will rise out of the oil if given sufficient time, and will escape and flow out through the casing if given an opportunity. This requires that oil and gas entering the anchor shall be caused to flow downward through it, without turbulence, at a velocity of less than the rate of rise of gas bubbles through oil. The length of this down-pass does not need to be very great. A further requirement is that there be a multiplicity of entrances to the anchor, the upper ones of which can serve as gas vents. It should be obvious that separated gas cannot escape through a small hole by which oil is entering. Adequate gas vents should be provided at a level considerably higher than the oil and gas inlets.

To minimize the bad effect of imperfect gas separation, types of pumps having a minimum clearance volume and operated with a moderate stroke are advisable. A pump pumping gas is acting as a compressor, and the volumetric efficiency of a compressor is dependent on a low clearance-displacement ratio. To this end the valve should be located in the bottom of the plunger, and the latter spaced as close to the standing valve as possible.

Suitable Displacement

Having been assured that leakage and slippage are small and the gas anchor is effective, displacement can be reduced nearly to the desired production rate. Displacement can be reduced by any or a combination of the following methods: (a) reducing length of stroke; (b) reducing number of strokes per minute; and (c) reducing pump diameter. Reducing length of stroke should only be resorted to if for special reasons other methods are not practical, as greater economies generally accompany the other methods. The life of a working barrel and valves is theoretically proportional to number of strokes per minute, and independent of length of stroke. Acceleration forces are proportional to the square of the number of strokes per minute. Therefore, great economies in pump, rod, and rig maintenance can be expected from reduced pumping speed, but not to such a great extent from reduced length of stroke. If the rod load is excessive, this condition may be relieved, and at the same time capacity ordinarily decreased by reducing pump diameter. It is to be noted that in the case of deep wells certain reductions of pump size may so greatly reduce loss of stroke, due to stretch, that the displacement will be increased instead of decreased. This can be computed from some of the foregoing formulas, and has been unmistakably encountered in field practice.

In the past, attempts to reduce displacement have been unduly timid and conservative. It should be obvious that displacement can vary over nearly as wide a range as production. In line with this idea, speed reductions of as great as 90 per cent are being found entirely practical.

Records

Almost as important to the success of high volumetric efficiency attempts as the foregoing considerations is the matter of complete and accurate records. Such records are desirable: First, as a guide to original changes; second, as a record of success or failure; third, as a guide to future changes if necessary; and, finally, as an evidence of ultimate success. Much of the essential information is generally available in one form or another, but it will be found well worth while to get all pertinent data together on one sheet, including that which can be secured from regular records and that which must be specially obtained. Information concerning a group of wells can be summarized on one sheet after changes are complete, showing typical operating data, efficiency and average production before and after the changes, and resultant power saving. Frequent personal inspection of wells, before, during, and after changes, by someone familiar with the principles and practice of efficient pumping, is generally essential. Many important factors that do not appear on ordinary reports would lead to impractical recommendations or erroneous interpretation of results unless observed. Such inspections can advantageously include securing of data relating to other subjects than volumetric efficiency, such as power efficiency, counterbalance, and general mechanical condition of equipment.

Method of Reducing Pumping Speed

Most moves to increase volumetric efficiency and secure consequent economies involve reducing pumping speeds. Moderate changes of speed are ordinarily easily accomplished, but to secure at reasonable cost the drastic reductions often desirable requires the proper selection or combination of methods.

Prime Mover

Steam engines can, of course, be greatly slowed down by mere throttling. This can be carried further if the well is properly counterbalanced. Gas engines can be slowed down somewhat, but there is generally a high limit of speed below which operation is unsatisfactory. The speed of oil-well type electric motors can be considerably reduced below normal by operating on controller points. As in the case of engines, this can be carried much further if the well is properly balanced. This practice is not ordinarily recommended, because motors give reduced efficiency when operating on points, so that the full power saving is not realized, and also because it increases the hazard of burning out motors unless special precautions are taken. However, where no other methods appear practical, it may be advisable.

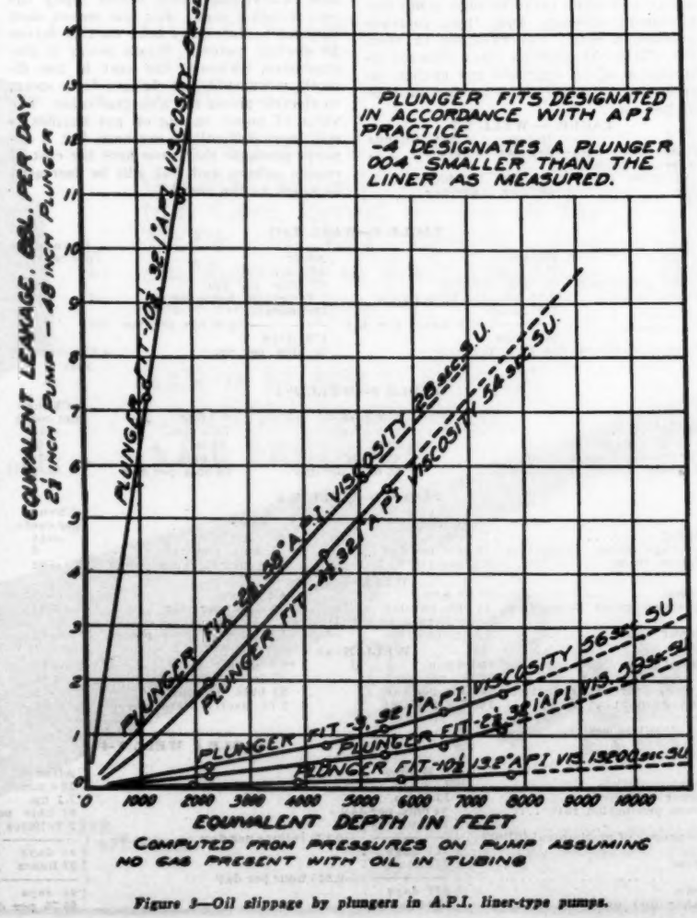

LABORATORY TEST CONDUCTED BY B H ROBINSON
PLUNGER FITS DESIGNATED IN ACCORDANCE WITH API PRACTICE -4 DESIGNATES A PLUNGER .004" SMALLER THAN THE LINER AS MEASURED.
EQUIVALENT LEAKAGE, BBL. PER DAY 2½ INCH PUMP — 48 INCH PLUNGER
PLUNGER FIT -4, 32° API VISCOSITY 58 SEC. SU.
PLUNGER FIT -2½, 32° API VISCOSITY 28 SEC. SU.
PLUNGER FIT -4, 32° API VISCOSITY 56 SEC. SU
PLUNGER FIT -2½, 32° API VIS. 28 SEC. SU
PLUNGER FIT -4, 32° API VIS. 13200 SEC. SU
0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
EQUIVALENT DEPTH IN FEET
COMPUTED FROM PRESSURES ON PUMP ASSUMING NO GAS PRESENT WITH OIL IN TUBING

Figure 3—Oil slippage by plungers in A.P.I. liner-type pumps.

Pulley Changes

Considerable speed reduction can generally be accomplished at a small expenditure by changing belt pulleys. Similar changes can be made on chain drives by changing sprockets; and in some reduction gear sets the gear ratio can be changed, although this is ordinarily more expensive. Belt-reduction ratio can be increased either by increasing the diameter of the driven pulleys or decreasing the diameter of the drive pulleys. Driven pulleys are ordinarily larger and, therefore, more expensive to change. The high limit of diameter is determined by the expenditure that can be justified. Sixty inches appears to be about the economic limit in ordinary cases. Reducing the diameter of drive pulleys raises a serious question as to how small a pulley can economically be used. There is no doubt that belt speed and tension being equal, reduction of pulley size decreases the life of a belt; but within a reasonable range the accompanying reduction of belt speed offsets this adverse factor. Further reductions, even at the expense of decreased belt life, are advisable on account of the other savings effected. In practice 10-inch motor pulleys and 12-inch counter-shaft pulleys have not resulted in excessive belt wear on wells of moderate depth with 15/35 motors and six-ply belts. Eight-inch motor pulleys are said to have been used successfully in some cases. Twelve-foot bandwheels appear advisable, at least for deeper wells, but the economies of still larger wheels is questionable.

Exchange of Motors

Most new oil-well type motors have virtually the same rated speed, but in past years slower speed motors were built, and many of these are still in use. By putting these slow speed motors on wells that most need slow pumping speed, and putting the new higher speed motors on wells where speed reduction is not a problem, some advantages can be secured at negligible cost. Where squirrel-cage motors are used, very advantageous exchanges can often be made. Note that reduction of speed should not substantially affect torque required and, therefore, horsepower rating may be reduced when speed is reduced. Any squirrel-cage motor ordinarily used for pumping can be replaced with one of lower speed and power in an identical frame, so that the change does not involve change of foundations, length of belt, pulleys or couplings. These several series of motor frame dimensions have now been standardized by the National Electrical Manufacturers' Association and the standards ratified by the American Petroleum Institute. Squirrel-cage motors are commonly made to operate at speeds ranging from 450 to 1,800 r.p.m. (on 60-cycle current), so that a speed variation of 4 to 1 can be accomplished by change of motor. It is often possible to make such changes without cost when new wells are being equipped, by buying slow speed motors instead of high speed motors, putting the slow motors on old wells, and moving the faster motors from the old wells to the new wells.

Additional Countershaft

Speed may be greatly reduced by the insertion of an additional countershaft between the prime mover and crankshaft. Where special pumping units are superseding belted countershaft unit, countershafts and belts may be available at little or no cost, and may be economically utilized for this purpose. Where countershaft drives were originally used, the additional countershaft is best installed so that the motor drives the new countershaft and the new countershaft drives the original. In case of gas engine drives, special countershafts are sometimes installed between the engine and the crankshaft, and chain or belt drives are used from engine to countershaft and countershaft to crankshaft. All such installations are considered of makeshift nature, and are necessitated by the original rig being designed without thought of ultimate slowing down.

Another arrangement that may per-

haps be considered a makeshift, but which is really economical and convenient to install and operate, consists of an additional small motor and V-belt or chain drive to the original motor or engine. Due to the slow-speed operation the power required for pumping is small, so that a relatively small squirrel-cage motor is adequate. The power required for this type of installation in connection with a standard belted rig with 6-inch rig irons is shown in Figure 4. During pumping

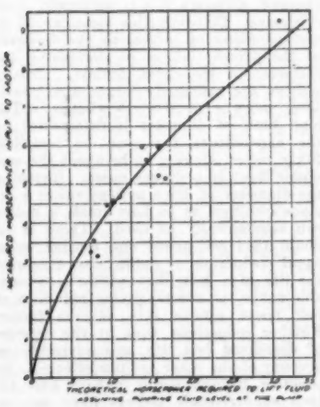


Figure 4—Power required for standard rig with additional small motor.

operations the original large motor or engine serves merely as a countershaft, and is driven by belts or chain from the little motor. This drive serves as an additional reduction; and since ratios as great as 7 to 1 are practical, very slow speeds can be secured easily. For pulling operations the belts are removed from the little motor, and the original prime mover used to pull the well with original speed and power. When a sheave larger than 25 inches in diameter is put on the large motor for this purpose, it must be removed while operating the large motor under its own power to eliminate danger of bursting due to centrifugal force. The sheave may sometimes be put on the end of the shaft of the large motor with the original pulley or gear coupling, but it is preferable to weld an extension on the opposite end of the shaft to carry the new sheave. This can be done at small expense. These installations have the advantage that practically any pumping speed can be secured by proper selection of sheave and pulley sizes and motor speed, and additional changes can be easily made as the production declines.

New Installations

All new pumping installations should be designed so that progressive speed reductions can be made during the life of the well with the minimum of trouble and expense. At least one good way of doing this is to provide a double reduction gear of sufficient ratio that a V-belt drive of 1 to 1 ratio, and a medium or high speed motor, will give the proper pumping speed for a new well. Later on, exchange of motors or use of increased V-belt ratio will provide any desired speed. For example, a 50 to 1 reduction gear and a 1,200 r.p.m. motor connected by a 1-to-1 drive will give an initial speed of 24 s.p.m. This speed should be adequate for most new wells, but can be further increased by a ratio of less than 1. By changing to a 600 r.p.m. motor and a 7-to-1 V-belt reduction, a speed of 1.7 s.p.m. will be secured. Any intermediate speed can, of course, be secured by less drastic changes of motor speed or ratio.

Practical Advantages of High Volumetric Efficiency

The many advantages indicated in the foregoing theoretical discussion have been actually secured in a large number of cases. Some of this work extends back several years, but most of the early work may be considered of an experimental nature. These experiments gradually become so successful that during the last year or two it has seemed justifiable to put into practice on a large scale the principles indicated by theory and proved by experiment. Already substantial benefits have been secured by these methods on approximately 125 wells of one company, and similar and further changes are being made as rapidly as they can be planned and put into execution. While during the experimental stages results were not always as expected and were, in fact, sometimes entirely unsatisfactory, it is a matter of record that during the last year in almost every case results have been fully up to expectations, and secondary changes have rarely been necessary except where natural conditions have changed.

In the following paragraphs specific examples will be given of the benefits secured. These examples are merely illustrative, and many more similar cases could be cited. It was pointed out above that very complete and accurate records are necessary to assure and prove the success of changes in pumping well operation, and such complete data are available and results of changes were critically observed. For the sake of brevity, however, only outstanding data will be presented, for a few cases.

Increased Production

Due to the present necessity for curtailment of production, increase of production is not directly desirable, and has not been a prime object of recent changes. However, it usually is good economy to secure maximum possible production from a well at any given operating speed, as any additional production is secured at little or no expense and may permit shutting down other wells. Production may be increased by the methods outlined above in one or more of the following ways:

1. Less shutdown time.—Lower operating speeds result in less maintenance and more producing hours per month. This, of course, results in a greater monthly production. For example, in the case of Well L-11 (Table 4) the time off for repairs was reduced 92 per cent by slowing down, which should result in a gain in production of 615 bbls. per year. Time shown is actual working time. As a matter of fact, there is some additional shutdown time while waiting for repair crew.

2. Gas anchors.—Replacing an inadequate gas anchor with one of greater capacity will often make surplus pump displacement effective and, thus, increase production rate. For example, in Well S-3 (Table 5) with no other change, installation of an improved gas anchor increased the average gross production rate 31 per cent.

TABLE 5—WELL S-3

	Before	After	Change
Gas anchor used	Regular	Improved	....
Average gross production rate	242 bbls. per day	318 bbls. per day	+31%

3. More displacement.—Where original displacement is not much greater than production, increase of displacement may substantially increase production. This is ordinarily found out in purely practical ways, but investigation of volumetric efficiency has revealed inadequate displacement (due to rod stretch) that was not suspected, particularly in very deep wells. For instance, if a pump has an apparent displacement of 600 bbls. per day (based on polish rod stroke) and is only lifting 100 bbls. per day, the possible advantage of increased displacement might be overlooked. Investigation may show, however, that actual displacement is only about 100 bbls., in which case an increase is indicated. In this case a decrease of pump diameter will increase displacement.

4. Less displacement.—In some cases a reduction of excess displacement appears actually to increase production rate. These occurrences are probably due to more continuous pumping instead of excessively rapid pumping, followed by "pumping off" and "gas locking" of the pump. Such gains are generally small and more often not noticeable, but have unmistakably occurred in several instances. For example, in the case of Well P-3 (Table 6) a reduction of speed from 25 s.p.m. to 7.3 s.p.m. resulted in an increase of gross production from 55 bbls. per day to 60 bbls. per day.

The existence of a "critical" fluid level and the advantage of exactly suiting displacement to production has not been observed by the writers. In fact, the absence of such advantage has been proved wherever tests have been made. In other words, further decrease of displacement in cases like Well P-3 has not resulted in further increase of production.

Reduction of Production Cost

Recent increases of volumetric efficiency have been mainly for the purpose of reducing operating costs. In this respect, they have been more successful than anyone would have dared to predict. The most tangible saving has been in electric power consumption, and it has been the practice not to recommend changes unless this saving alone would repay the cost within a year. For this reason most changes to date have been on rigs driven by electric motors. Steam power is also expensive, although the cost is not directly measurable, so changes from steam to electric power are also profitable. The value of power saving on gas engines is still more difficult to evaluate, but it appears probable that even here the cost of engine upkeep and fuel will be decreased as much as the speed.

It is now becoming apparent that economies of maintenance are actually greater than power saving, so that the total advantage in the case of electric driven rigs will be more than twice as great as estimated, and slowing down of gas-engine pumped wells will be very much worth while, even though no power saving can be credited to the job. After the cream of the saving is skimmed by slowing down the most excessively displaced electric-driven wells, it is planned to go further and make every change where an economic study shows that the estimated total saving of operating cost will repay installation cost, depreciation, and interest on additional equipment during the probable life of the well.

1. Power saving.—A reduction of pumping speed is generally accompanied by an approximately proportional reduction of motor power input. A few illustrations of power saving are presented in Table 7. Speed reductions range from 72 per cent to 89 per cent, and power savings from 71 per cent to 82 per cent. In one case the power saving at 1.5 cents per kilowatt hour would amount to $3.56 per day, or about $1,300 per year.

2. Less emulsification.—While no quantitative data are available, it has been clearly observed in a number of cases that pumping with high volumetric efficiency results in much less emulsification. In some cases this may result in a slightly higher percentage recovery of clean oil and some reduction of dehydration costs. In extreme cases it might obviate special methods of dehydration.

3. Reduction of maintenance.—All cases of reduced pumping speed, so far as observed, have resulted in substantial reductions of maintenance costs, amounting in some cases to almost complete elimination of maintenance work. This applies to both maintenance of rig and below-ground equipment. Well V-4 (Table 8) and Well L-11 (Table 4) illustrate reduction of maintenance in two special cases, labor charged to the well being reduced 92 per cent and 84 per cent, respectively. Extensive data that have not been summarized indicate that the cost of equipment and material has been similarly reduced.

Moderate slowing down of 11 wells in one field so greatly reduced maintenance work that it was possible to transfer seven men to a division where work was expanding. Reducing the speed of a jack plant from 12.5 s.p.m. to 6.1 s.p.m. practically eliminated jack line breakage which had previously occurred on an average of about twice a day. Another jack plant was slowed down from 13 s.p.m. to 6.5 s.p.m. Prior to the change it just about kept a crew busy maintaining well equipment and jack lines. After slowing down, repair jobs were so infrequent that the crew was moved to another lease and sent back by truck on rare occasions when their services were needed.

Conclusion

Study of volumetric efficiency is essential to effective and economical operation of pumping wells. High volumetric efficiency has not commonly been secured in the past, but can be obtained in the pumping of practically any class of well. Attaining of high volumetric efficiency sometimes results in increased production and always results in substantial economies. Power savings of 50 per cent to 90 per cent may often be accomplished, and labor and equipment savings of about the same range of percentages, but of greater value, may be expected. The feasibility of attaining high volumetric efficiency and consequent advantages have been so extensively demonstrated, and the cost is generally so small, that there is no excuse for not securing them on practically all wells as rapidly as the necessary engineering work can be accomplished and the installations made.

TABLE 4—WELL L-11

	Before	After	Change (per cent)
Speed	21.3 s.p.m.	10.0 s.p.m.	—54
Gross production	47 bbls. per day	47 bbls. per day	0
Power input	17.85 electric horsepower	5.2 electric horsepower	—71
Time off for repairs	243 hours / 261 days = 0.93 hours per day	12 hours / 176 days = 0.07 hrs. per day	—92
Loss of production	665 bbls. per year	50 bbls. per year	+615 bbls. per year

TABLE 6—WELL P-3

	Before	After	Change (per cent)
Speed	25.0 s.p.m.	7.3 s.p.m.	—71
Polish rod stroke	32 in.	40 in.	+25
Estimated displacement	400 bbls.	93 bbls.	—76
Average gross production	55 bbls. per day	60 bbls. per day	+ 9

TABLE 7—WELL V-6

	Before	After	Change (per cent)
Speed	25.5 s.p.m.	2.77 s.p.m.	—89
Average gross production	18 bbls. per day	18 bbls. per day	0
Power input	9.13 electric hp.	1.64 electric horsepower	—82
WELL A-8A			
Speed	23.5 s.p.m.	4.4 s.p.m.	—81
Average gross production	17 bbls. per day (perhaps subnormal)	24 bbls. per day	+41
Power input	6.33 electric hp.	1.81 electric horsepower	—71
WELL H-A3			
Speed	22.3 s.p.m.	*6.5 s.p.m.	—72
Stroke	32 in	40 in.	+25
Average gross production	30 bbls. per day	30 bbls. per day	0
Power input	16.95 electric hp.	3.75 electric horsepower	—78

*Still excessive.

TABLE 8 WELL V-4

	Before	After	Change (per cent)
Speed	27 s.p.m.	10 s.p.m.	—63
Power input	13.85 hp.	7.2 hp.	—48
Gross production rate	94 bbls. per day	94 bbls. per day	0
Frequency of mechanical failure	35 failures / 271 days = 0.129 failure per day	2 failures / 94 days = 0.021 failure per day	—84
Crew	234 hours / 271 days = 0.865 hour per day	21 hours / 94 days = 0.222 hour per day	—74
Labor and overhead	$2.94 per day	$0.75 per day	—74

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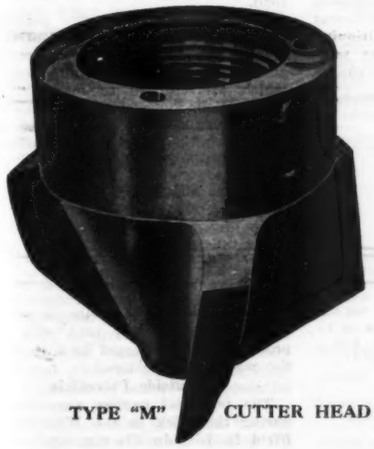

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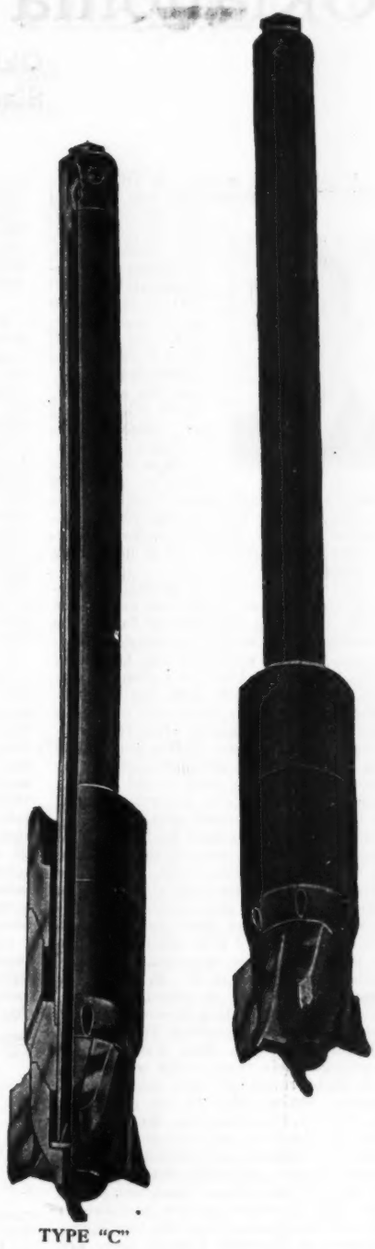
Brewster offers three features in one combination that gives you more efficient and economical results.

1. The SPLIT LINER is furnished with the Perfection Core Barrel so your core comes out undisturbed and unbroken.

2. TYPE M CUTTER HEAD allows water circulation on the cutting edge so the core is cut clean and quickly from the hardest formations. By the use of TYPE M BIT BODY (which is furnished free) the TYPE M CUTTER HEAD can be used with the TYPE C CORE BARREL.

3. ROLLER CUTTER HEADS can also be used with the Perfection Core Barrel by use of the TYPE M BIT BODY, thus enabling you to cut the hardest rock formations.



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Oklahoma Production Above Allowable

Oklahoma City Operators Will Ask to Be Allowed the Slack From Estimated Underproduction in Seminole

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

A substantial increase in Oklahoma's daily average production was reported for the week ending November 21. The figures show an increase of approximately 14,800 bbls. a day, with an average production of 558,000 bbls. a day, about 12,000 bbls. a day over the allowable, which was placed at 546,000 bbls. during November.

Many believe the State's allowable production will be reduced to approximately 500,000 bbls. a day during December, as the market demand is declining and some crude oil is now going to storage.

Several changes in the proration situation are expected to develop during the week. Operators are expected to ask the Oklahoma Corporation Commission to increase the allowable of the Oklahoma City Field, by taking the underage from the Greater Seminole area, the quantity depending upon the decline in potentials in the Greater Seminole area. It is estimated to be between 15,000 and 20,000 bbls. daily. It was generally agreed that the Oklahoma City area would get any benefits resulting from a lower potential in the Greater Seminole area.

Some step is expected to be taken to put an umpire in charge of the proration in the Oklahoma City Field, to take the place of the commission's committee, which has served since November 1. It was stated at that time that the committee would serve only until such time as conditions were improved. The committee is composed of W. N. Stokes, of Tom Slick Oil Co., as chairman; B. G. Patton, an independent operator, and C. O. Rison, with the Indian Territory Illuminating Oil Co. They have devoted nearly all their time to the work.

A slight revival in field operations is expected during the next few months in the Greater Seminole area. In the older areas in the State an increase in operations is expected in, Creek, Lincoln, Logan, Payne and Oklahoma Counties. In the shallow areas, Muskogee, Wagoner and Marshall Counties continue to be attractive to operators. In the Kingston area of Marshall County, there are six drilling wells.

Potentials in Oklahoma City

Operators in the Oklahoma City Field are expected to complete the last potential gauge this week. Up to and including November 19, potentials on 633 wells had been completed which brought the adjusted potential total of these to 2,750,533 bbls., which is one-third of the 24-hour rated gauge. Of the total, 234 wells in the Wilcox sand showed a potential of 2,126,709 bbls.; 42 wells in the Arbuckle lime area, 24,279 bbls.; 353 wells in the lower Simpson sand, 596,487 bbls., and 4 wells in the fault zone area, 3,078 bbls. This summary of potentials includes wells with their first potentials taken in October. Comparative potential gauges will not be available for several days but it is believed the field will show a decline which is being estimated from 14 to 20 per cent, compared with the potentials of last July.

Some express the opinion that the allowable production in the Oklahoma City Field is due for a gain at the end of the present period, December 1. Under the ruling of the Oklahoma Corporation Commission, when the present proration order was made it stated that any underage from potentials in the Greater Seminole area would be allotted to the Oklahoma City district, which would permit the Oklahoma City Field to go as high as 200,000 bbls. a day. Under the order the Greater Seminole area is limited to 150,000 bbls. a day, which is one-half of the estimated potential gauge.

Decline of Greater Seminole

In the areas that have completed their potential gauges in the Great Seminole area, nine pools had an estimated potential of 160,799 bbls. a day, some being actual gauges and others estimated under the 3 per cent decline curve. The same nine pools, under the new potentials show a total of 132,520 bbls., which amounts to a decline of 28,279 bbls. It is believed that this amount should be sufficient to give the Oklahoma City Field an allowable of 200,000 bbls. a day. However, it has been recently suggested by some of the pipe line companies that the State's allowable be reduced to 500,000 bbls. a day, which will mean a reduction of approximately 46,000 bbls. a day to be allocated among the flush areas in the State.

Sand Cuts Connections

One of the few wells in the Oklahoma City Field to threaten to cut its connections while taking its potential gauge, was Spring Rose Drilling Co.'s No. 1 Henry, in Section 2-11-3w, in the north end of the field. Sand damaged the connections on the two upper master gate valves when the operators attempted to take a potential gauge of the well. The sand cutting did not become alarming until several hours after the well was opened. Precautionary measures were taken to prevent damage should the well become wild. Several families in nearby houses were moved out.

Approximately 20 wells have cut or damaged connections caused by taking potential tests. Many of the wells that cut connections on the first tests, made changes and proceeded to get potential gauges. Another large well delayed by cut connections was the Phillips Petroleum Co.'s No. 1 McBeth, NW cor. SW NE, Section 10-11-3w, which flowed 95,000 bbls. a day on its first test through 9-inch casing.

Phillips' Petition

During the week the Phillips Petroleum Co. filed a petition with the Oklahoma Corporation Commission, which will be heard at its December 8 hearing, to plug back or recondition wells producing from more than one horizon in the Oklahoma City Field. The petition asks that 78 wells that are producing from both Wilcox sand and Simpson, and that wells in the Simpson-Johnson areas, be plugged or reconditioned, as they are producing from more than one horizon, permitting the entrance of water into the upper sands. The petition also claims that the Wilcox sand zone is threatened by water, and plugging off of the water is suggested, as a means of saving the zoning from further encroachment.

Committee to Study Field

The Oklahoma Corporation Commission has named a committee to study the conditions in the Oklahoma City Field. Reports are to be heard at the meeting December 8. Members of the committees include M. J. Kirwin, Indian Territory Illuminating Oil Co.; J. Van Dall, Sinclair Oil & Gas Co.; H. S. Thomas, Tom Slick Oil Co.; R. W. Brauchli, Anderson-Prichard Oil Corp.; E. J. McKee, Wirt Franklin Petroleum Corp.; J. R. McWilliams, Skelly Oil Co.; E. F. Guidinger, Phillips Petroleum Co.; and R. L. Clifton, Champlin Refining Co.

The special production problems include gas-oil ratio, the proposed rule to equip producers with chokes or other flow devices, a rule for the adjustment of potentials on wells having different sized casing, a rule for reconditioning wells producing from the Wilcox sand and other horizons, and a rule for changing from the per well to per lease allowable in fixing proration.

The future development of the Oklahoma City Field is expected to be limited to two areas. These are expected to be on the southwest and west sides of the field. This is indicated by the recent wells that have been completed in these areas and the fact that potential gauges on these wells are showing small declines. Many geologists believe that the Wilcox sand in the southwestern part of the field will be limited to a narrow strip. Just how far west the large gusher production will extend from the most westerly completed wells, the Phillips Petroleum Co. and others' No. 1 Egermier, in SW cor., Section 23-11-3w, and Kessler Oil & Gas Co.'s No. 1 Canning, SE cor., Section 22-11-3w, both having a potential of around 29,000 bbls. a day, is anybody's guess. Some predict a fault break on the west side of Section 22-11-3w, extending in a northwesterly and southeasterly direction. Considerable production is expected in Section 22-11-3w, and on the north of this in Section 15-11-3w, but before the territory in Section 15-11-3w can be explored the U-7 drilling zone will have to be extended to within the city limits.

The owners of leases in the district expect development to be slow because of the proration orders now in effect in the Oklahoma City Field. If the field is allowed a larger allowable flow, a drilling campaign is expected to develop in these districts.

Pipe Line Shipments

Pipe lines from the Oklahoma City Field continue at a normal rate. For the week ending November 14, a total of 1,220,434 bbls. was shipped out from the field.

The umpire's staff was nearing the end of the gauges for potentials and more attention was being given to the classification of wells making water and which are entitled to marginal allowables. Wells on which the adjusted potential was figured included the following, the adjusted potentials being one-third of the 24-hour gauge:

Company and well—	Bbls.
Slick Oil Co., No. 1 Dennis	2,082
Slick Oil Co., No. 1 Frisco	4,964
Slick Oil Co., No. 1 Moore	173
Skelly Oil Co., No. 1 Hurt	18,729
I.T.I.O., No. 3 Button	73
I.T.I.O., No. 8 Trosper et al	809
I.T.I.O., No. 3 Fuzzell	97

Reconditioning of wells in the field continues at a steady rate, with 15 old producers being plugged back to shut off the water encroachment.

Outside Potentials

The potential gauges were completed during the week in the West Chandler Field in Lincoln County, and the Wewoka townsite and the Fish Pool. The West Chandler Field had a potential of 33,000 bbls. on a 12-hour gauge. The production of the field is limited to 3,900 bbls. a day. The potential of the Wewoka townsite is limited to 6,000 bbls. a day. The Fish Pool, shows a potential of 5,118 bbls. on 24-hour gauge, while the production is limited to 1,500 bbls. a day. The amount allowed to each of the pools will be prorated among the several leases there as provided by the orders of the Oklahoma Corporation Commission.

During the week the West Perry area was given an increase in its allowable output. The field is located in Noble County and was increased from 400 to 800 bbls. a day by the corporation commission, after recommendations from State Umpire Ray M. Collins. Champlin Refining Co. is purchasing the crude oil from this district and has increased its

(Continued on Page 80)

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Brothers' No. 1 Forbes, SE cor. NW NW, Sec. 12-27-11w	S.D. 1,232 ft.
J. W. Bailey's No. 1 Acre, SW cor. NE Sec. 14-24-11w	S.D. 5,502 ft.

ATOKA COUNTY

Campbell's No. 1 Baird, NW NE SW Sec. 21-1-13	Rig.
Edgerton Edwards' No. 2 Rowland, SE NE NW Sec. 6-1-15	Rig.

BECKHAM COUNTY

Price-McFann's No. 1 Webster, C SW SW Sec. 34-8-26w	T.D. 2,344 ft; plugged back to 1,890-1,900 ft; 1,500,000 ft. gas.
Mid-Continent's No. 1 Schaff, C NE SW Sec. 22-11-22w	Waiting on cmt. to set 430 ft.
Mid-Texas Co.'s No. 1 Sidell, NE cor. SW SW Sec. 17-2-22w	S.D. 2,550 ft.
White et al's No. 1 Green, SW cor. Sec. 34-10-24w	S.D. 3,575 ft.

BLAINE COUNTY

Washoma Oil Co. et al's No. 1 Phillips, C NW SW Sec. 13-19-10w	S.D. 5,115 ft.

CADDO COUNTY

Abernathy & Brown's No. 2 Houston, Sec. 24-6-13w	S.D. 1,115 ft.

CHEROKEE COUNTY

La Piere et al's No. 1 Woods, C SE SE Sec. 27-17-21	S.D. 1,196 ft.

COAL COUNTY

Radial Oil Co.'s No. 1 McGraw, NE NW Sec. 2-1s-8	S.D. 1,165 ft.
McCraw Oil Co.'s No. 1 Ward, NE SE Sec. 35-1-8	Drlg. plug; showing 2,000,000 ft. gas 1,765-1,846 ft; mudded off gas; S.D.; rig moved.
Whitney et al's No. 1 Miller, SE NE Sec. 10-2-8	S.D. 760 ft.

COMANCHE COUNTY

G. W. Stogner's No. 1 Doebel, C SW SW Sec. 3-3-9w	S.D. 1,450 ft.

LE FLORE COUNTY

H. E. Dowd et al's No. 1 Unknown, SE NE Sec. 17-3-33	Fishing 1,112 ft.

GARFIELD COUNTY

E. L. Love et al's No. 1 White, SE cor. NW Sec. 9-24-6w	S.D. 5,850 ft.

GARVIN COUNTY

Malarnee et al's No. 1 Phillips, NE SW SE Sec. 24-2-2w	S.D. 4,830 ft.

GREER COUNTY

Dovell et al's No. 1 Capell, NW cor. Sec. 1-7-22w	5,000,000 ft. gas 1,455-65 ft; T.D. 1,760 ft.
French's No. 1 Murphy, SW NW Sec. 22-7-21w	S.D. 1,645 ft.

HARPER COUNTY

Sinclair O. & G. Co.'s No. 1 Howell, C SW SW, Sec. 14-26-24w	20,000,000 ft. gas 5,350-5,400 ft; T.D. 8,539 ft; S.D; sprayed 50 bbls. gasoline.

HASKELL COUNTY

Ault et al's No. 1 Harrison, CWL SE NE, Sec. 14-9-19	S.D. 650 ft.
Ault et al's No. 1 Hall, NW SW SW, Sec. 14-9-19	S.D. 2,000 ft.

(Continued on Page 70)

Central Kansas Shows Better Than Ever

Continued Discoveries of New Pools Point to Widespread Future Development. Commission Limits 2 New Wells

By W. A. Spinney
Staff Correspondent, Kansas Fields

Developments in Kansas during the week further indicate that the central western part of the State will develop into a large producing area. Wildcat tests continue to find oil in scattered areas. A series of interesting developments are expected in 1932 when the districts are being drilled. Crude oil production in the State for the week ending November 21, shows an increase of approximately 1,800 bbls. a day. The daily average of the same seven days was approximately 104,510 bbls.

Another wildcat well in southwestern Ellsworth County found oil production in the Silicious lime indicating that another pool exists in that district. The test was the Derby Oil Co. and Aladdin Petroleum Corp.'s No. 1 Stoltenberg, C SW, Section 22-16-10w, which swabbed 75 bbls. of oil the first hour, without lowering the oil in the hole. The oil was found in the Silicious lime at 3,347-61 feet. The operators estimated the well to be a 1,500-bbl. producer. It is the second well to produce large quantities of oil in the vicinity, the other was Tom Palmer and Gypsy Oil Co.'s No. 1 Stoltenberg, which is also estimated to be a 2,000-bbl. well, but is shut in awaiting a pipe line outlet.

Limits 2 New Wells

At a hearing held in Wichita November 19, the Kansas Public Service Commission, in an attempt to adopt a uniform policy, decided to limit the output of two wildcat wells recently drilled. Mid-West Exploration Co.'s No. 1 Richardson, SE cor., Section 36-22-12w, Stafford County, was limited to 20 per cent of its potential, which was 1,800 bbls. a day. The other was Hilligoss and others' No. 1 Isern, in Section 12-20-11w, Barton County, which was permitted to produce wide open for five days and for the next 30 days, November 19 to December 19, will be limited to 500 bbls. a day. After that time the well will be allowed to produce 20 per cent of its potential.

The hearing was called by Umpire Lloyd R. Pickrell, acting as agent for the producers. Operators charged that wells in some of the pools were allowed to produce their full potential capacity while those in near-by pools were held down to 20 per cent and some remain shut in because of no pipe line connections.

At the present time the Schurr Pool in southwestern Rice County, which is about 3½ miles east of Hilligoss and others' well, is prorated to 20 per cent of its potential production. Operators claimed that some of the pipe line companies were taking all of the potential from the above wells.

Another wildcat well in Barton County is attracting much attention. Skelton Oil Co.'s No. 1 Ott, C SE SE, Section 16-19-14w, found a showing of oil in the Lansing lime at 3,225 feet. After the oil showing was found the test was shut down to perfect land titles. This is the third showing of oil found in the well. The first was 1,729 feet, the second at 2,645 feet. This test is believed to be located on the Ellsworth arch.

An Important Dry Hole

H. Rosenthal and others' No. 1 Dielman, NE cor. SE SW, Section 35-19-2w, which had the appearance of a prospective producer, has proved to be a dry hole in the chat formation. The test defines the western edge of the Ritz-Canton Field, in McPherson County. There is a possibility of the test being drilled deeper to the Viola formation before it is abandoned. The chat was found at 2,933-58 feet without any showing. The well is located a half mile west of a 5,000-bbl. well in the chat formation.

The Skelly Oil Co.'s No. 1 Miles, NE cor., Section 30-27-10w, Kingman County, will be given a production test and it is planned to produce the well regularly, if the test is satisfactory. If not, the company plans to drill to the Silicious lime. Preliminary to the production test, a 4-inch pipe line is being constructed from the well to a loading rack at Cunningham, about 1½ miles distant. The oil was found in the Lansing lime from 3,389-3,441 feet, and the well, when completed, was estimated to be making 400 bbls. of oil and 3,500,000 feet of gas a day. It was drilled on a block of 7,000 acres all owned by the Skelly Oil Co. The showing indicates that a pool has been found as the well is considerably higher on structure than a test that was drilled several miles to the east which had a small showing of oil in the same formations. While the Skelly test was drilling it found several showings of oil and gas in the upper formations.

In Sedgwick County

Another well was added to the Eastborough Pool, in Sedgwick County, during the week, when the Derby Oil Co.'s No. 2 Eastborough, SE cor. SW NE, Section 19-27-2, an old well drilled deeper from the chat to the Viola lime at 3,229-33 feet, came in. It is estimated to be good for 600 or 700 bbls. a day, but no production test had yet been made.

Other tests in the vicinity that are expected to reach the pay in a few days include, Magnolia Petroleum Co.'s No. 1 Wheeler, SW cor. SE NE, Section 19-27-2, the east offset to the Derby Oil Co.'s No. 2 Eastborough, landing casing at 3,205 feet and Fisher & Lauck's No. 9 trustee, NE cor. SW SE, Section 19-27-2, with a showing of oil in the chat at 2,950 feet.

Orderly Development

Central western Kansas now appears to be the next locality that will undergo a drilling campaign when conditions in the industry warrant it. All the major oil companies are centering their attention on the area, where during the last two years a large percentage of the wildcat tests have proved productive. No less than a dozen pools have been opened in that time, and none have been developed as yet. It is expected that some time during the coming year considerable work will be started. Most of the exploratory work will take place along the Ellsworth arch.

It has taken a good many years to locate these pools and it is believed their development will be in an orderly manner. The regulatory laws and the compact between the states of Texas, Oklahoma and Kansas limiting the daily production to market requirements indicates that these areas will be exploited in an orderly way.

One of the most recent discovery wells along the Ellsworth arch was in southeastern Barton County, adding to the attractiveness of the central part of the State. The well was Hilligoss and others' No. 1 Isern, in Section 12-20-11w, which was put to pumping and averaged 225 bbls. for seven days. The well did not produce to its full capacity, as the operators had considerable mechanical trouble. The actual potential of the well has not as yet been decided. The oil was found in the Silicious lime at 3,313-28 feet. The output is being shipped out through a pipe line which connects the well with the Prairie Pipe Line Co.'s line near Raymond.

After the well was completed several large lease transactions were reported. Prices ranging from $500 to $1,000 an acre were believed to have been paid for offset acreage. The Derby Oil Co., which purchased one of the offsets, is preparing to start a test in the near future.

Russell County Dry Hole

A wildcat test started more than a year ago was completed last week as a dry hole, and was being abandoned. Austin Drilling Co. and others' No. 1 Rockefeller, SE cor., Section 6-13-12w, Russell County, found water in the Silicious lime at 3,555 feet after being drilled to a total depth of 3,657 feet. The test was started by the Austin Drilling Co. and was shut down at approximately 1,700 feet where it was drilled deeper by the companies owning offset leases.

In the Eastern Counties

Activity in the eastern part of Kansas continues at a steady rate. In Miami County, 2 miles south of Osawatomie, and extending 3 miles south and east, the Allen Gas Corp. and others have completed 15 producing gas wells in the shale formation at total depth ranging from 450 to 650 feet. The average open flow of these gas wells is approximately 250,000 feet a day per well. Oyster and Hay's No. 1 in Section 6-19-23, Miami County, was completed during the week, making 1,000,000 feet of gas a day from the first sand at a total depth of 325 feet. The Panhandle Eastern Pipe Line Co. is now laying a pipe line to connect these wells.

Another interesting pool has been found 9 miles southeast of Paola, in Miami County, known as the Block Pool, where several oil and gas wells have been completed and are shut in awaiting a pipe line connection. In the Block Pool, Merker & Dabney have completed two oil wells in the second sand at a total depth of 495 feet. In the same area, Endicott and Dennerline have completed a well in the same sand at a total depth of 490 feet. These wells are estimated at 15 bbls. a day each. In addition to these oil wells there are approximately 30 gas wells in the vicinity all producing from the second sand which have an open flow of approximately 12,000,000 feet of gas a day, all of this gas being taken by the Panhandle Eastern Pipe Line Co.

Two wells drilled deeper in the Haury Pool, in Reno County, have increased their production, each getting large gas production. Study and others' No. 1 Haury, NE cor. SW, Section 1-23-4w, was drilled to 3,369 feet and was making 14 bbls. of oil an hour and 26,500,000 feet of gas a day. Continental Oil Co.'s No. 1 Blake, SW cor. SE SE, Section 23-23-4w, was drilled to a total depth of 3,318 feet, and increased its gas production to 10,000,000 feet a day.

Dry Hole in Jefferson County

A wildcat test in Jefferson County in the northeastern part of the State was found dry and was abandoned. D. Anderson and others' No. 1 Stine, C NE, Section 10-11-18, was drilled to a total depth of 1,565 feet. The log does not reveal any showings of oil or gas in any of the upper formations.

Barton County

Hilligoss and others' No. 1 Isern, SW cor. SE NE, Section 12-20-11w, has been completed for 480 bbls. in sand 3,315-29 feet.

Butler County

Bennett & Abels' No. 1 Jones, NW cor. NE NE Section 25-25-4, is spudding.

Coffey County

Aikman & Baker's No. 1 Povenmire, SW cor. NW, Section 14-22-13, has been completed for 50 bbls. in sand 1,835-57 feet.

Cowley County

McKnabb and others' No. 1 Brane, Lot 4, Kirkbride Addition, city of Winfield, Section 22-32-4, originally completed at 2,366 feet, is now drilling deeper at 2,565 feet. No. 2 Wallace, Lot 3, Kirkbride Addition, city of Winfield, Section 22-32-4, is being deepened from 2,956 feet, now drilling at 3,307 feet. Wakefield and others' No. 1 Fent, Lot 8, Block 41, Musgrove Addition, city of Winfield, Section 22-32-4, is rigging up to deepen from 2,937 feet to go to Viola lime. Knox

(Continued on Page 72)

WILDCAT OPERATIONS IN KANSAS

(Descriptions are East unless marked otherwise)

BARTON COUNTY

Company, farm and location—	Remarks:
Syndicate Oil Co.'s No. 1 Boretz, NW SE SE, Sec. 3-18-12w	Underreaming 3,070 ft.
Skelton Oil Co.'s No. 1 Ott, C SE SE, Sec. 16-19-14w	S.D. 3,156 ft.
McCool et al's No. 1 Tsern, NW SE NE, Sec. 12-20-11w	Show oil 3,313-27 ft.; swabbed 540 bbls. 20 hrs.

CHASE COUNTY

Borden et al's No. 1 Atkinson, NW SE, Sec. 18-18-7	Abandoned 50 ft.

CLAY COUNTY

Crystal Oil et al's No. 1 Tivier, SW cor., Sec. 19-8-2	S.D. 2,700 ft.

COWLEY COUNTY

Slocum et al's No. 1 Union National Bank, C SW SW, Sec. 16-35-4	S.D. 1,950 ft.

DICKINSON COUNTY

Severs et al's No. 1 Lavengood, NE SW, Sec. 13-13-2	S.D. 4,546 ft.

ELLSWORTH COUNTY

Alyward et al's No. 1 Stratman, SE NW SE, Sec. 1-17-10w	Silicious 3,255-71 ft.; 117 bbls. 2 hrs.; shut in; estimated 2,000 bbls.; no pipe line connections.
Aladdin Pet.'s No. 1 Stoddenberg, C SW, Sec. 22-16-10w	Silicious lime 3,332-47 ft.; estimated 1,500 bbls. a day; shut in.

FINNEY COUNTY

National Ref. Co.'s No. 1 Wells, C SW, Sec. 13-23-30w	Drlg. 1,800 ft.

HARVEY COUNTY

Liggett et al's No. 1 Davis, SW SE NE, Sec. 7-24-1	S.D. 1,505 ft.
J. P. Flannigan's No. 1 Sheridan, C SW, Sec. 32-22-1	Drlg. 3,948 ft.

KINGMAN COUNTY

Skelly Oil Co.'s No. 1 Miles, NE cor., Sec. 30-27-10w	1,635-40 ft. 2,000,000 ft. gas; at 2,005-20 ft., 6,000,000 ft. gas; at 1,133-42 ft., 3,000,000 ft. gas; showing oil 3,385 ft.; T.D. 3,441 ft.; S.D. estimated at 600 bbls. a day.
Panhandle Drlg. Co.'s No. 1 Wetherall, C SE NW SW, Sec. 20-28-10w	Rig.

MORTON COUNTY

Hydraulic Oil Co.'s No. 1 State Land, NW SE, Sec. 22-34-43w	T.D. 3,640 ft.; temp. abd.

MORRIS COUNTY

Allender et al's No. 1 Wycoff, C SW SE, Sec. 5-17-7	S.D. 105 ft.
Urschel et al's No. 1 Bersuch, NW SE NW, Sec. 10-17-7	Fishing 915 ft.
Hankerson et al's No. 1 Cessman, SW SE, Sec. 24-16-9	S.D. 2,625 ft.

NORTON COUNTY

Richards et al's No. 1 Colby, Sec. 17-4-21w	Rig.

(Continued on Page 68)

New Gas Field Near Louisiana Border

Well in Shelby County, Texas, Looks Good for 30,000,000 Feet Per Day. Not Yet Completed. Other Wells Dry

By J. R. Crumpton
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Nov. 23.—The outstanding development in this district during the week was the testing of E. L. Chapman's No. 1 Pickering Lumber Co., C. E. Henry Survey, in the northeastern part of Shelby County, East Texas, near the Louisiana state line. Although not completed for its full potential flow, the test has proved the existence of a new gas field on the western part of the Sabine Uplift, a structure covering a great part of North Louisiana and several counties in East Texas. With the bottom of the hole at 3,864 feet, 5⅞-inch casing was set at 3,102 feet, and after drilling plug the hole reamed to 3,325 feet. At this depth the well began making gas and with drill stem out of the hole is now making about 8,000,000 feet of dry gas after bridging over several times. The casing was set 762 feet off of bottom because the operators were not sure of the depth from which the gas was coming, and with that much open hole the well has not been able to clean itself out. To get the full open flow the hole will have to be reamed to the bottom and liner set within the 5⅞-inch casing. A conservative estimate is that the wildcat will make at least 30,000,000 feet of gas daily when completed.

First Flow

The new gasser first blew in unexpectedly last June while the crew was changing bits and was estimated to be flowing 25,000,000 feet of gas at that time. The gas was coming from an open hole with the exception of 400 feet of 12-inch surface casing which later collapsed. The operators finally succeeded in setting about 800 feet of 6-inch casing inside the collapsed 12-inch and was able to kill the flow and bring the well under control after blowing wild for several weeks. The new discovery is about 2 miles from the Louisiana line, across the Sabine River from the town of Logansport in De Soto Parish. Joaquin is the nearest Texas municipality, about 1 mile west of the test. The nearest gas field is to the north in Panola County, the Bethany Field, in the northeastern part of the county near the southwest line of Caddo Parish, Louisiana. The Bethany Field produced gas from several horizons, from around the 900-foot level down to the Oolitic lime in the Trinity horizon around 4,700 feet. The Zwolle Field of Sabine Parish, Louisiana, which produces oil from the chalk rock from 2,200 to 2,400 feet, is about 25 miles southeast of the new gas area.

Unidentified Formation

No identification has been made on the formation from which the gas is coming, a log of the well not being available, but checks on the well show that the drill penetrated hard lime for the last 600 feet, coming into that formation from broken chalk and shale. It is below the Woodbine in the lower Cretaceous, possibly the Comanche, but more than likely the pay is coming from the upper Trinity, probably the Glenrose which pays off in some of the other fields located on the Sabine Uplift.

Previous Tests

The new discovery is in hitherto unproven territory, but in 1928 the Gulf Production Co. drilled three tests from 5 to 7 miles southeast of the Chapman well in Shelby County. The first well, its No. 1 Pickering Lumber Co., G. H. Patterson Survey, produced about 5,000,000 feet of gas from 3,251 feet and was completed at 3,440 feet and flowed on an average of 48 bbls. of oil daily until abandoned in March of this year. The same company's No. 1 Carraway, Aaron Castelberry Survey, in the vicinity of the first test, was abandoned in gray lime at 6,580 feet after showing gas at various depths.

Six Wells Completed

Of six completions reported from two states, five were dry holes and one a gas well. The Hinds County area of the Jackson Field in Mississippi turned in the only producer, James Alexander's No. 1 Casey, Section 12-5n-1e, having an estimated initial flow of 25,000,000 feet of dry gas from 2,388 feet. In Rankin County, J. E. Grandstaff and others' No. 1 East, Section 12-5n-1e, which blew in wild a week ago with an estimated flow of 25,000,000 feet of gas, has been brought under control by pumping heavy mud into the hole. The total depth of this well is 2,382 feet. One wildcat in Mississippi had disappointing results, the Mississippi Drilling Co.'s No. 1 Scarborough, Section 15-13-14, in Winston County, being dry and abandoned at 4,039 feet.

Two tests that would have extended the Richland gas field to the west and northwest met with barren results. The Southern Carbon Co.'s No. 1 Pollard, Section 26-16-5e, tested dry from 2,420 to 2,454 feet and was abandoned at 2,480 feet. The test was more than 1 mile west of previous production. The United Gas Public Service Co.'s No. 5 Earle, Section 25-17-15e, in the northwestern part of the field was dry and abandoned at 2,704 feet. This well tested dry from 2,422 to 2,549 feet and encountered salt water at 2,694 feet. A wildcat in De Soto Parish, Ben Merritt, Trustee's No. 1 Wollums, Section 29-12-12, found salt water and was abandoned at 2,930 feet. A disappointment to the unproven area between the Zwolle and Blue Lake Fields was the abandonment of W. M. Coates' No. 1-A Bowman-Hicks, Section 18-7-13, at 2,600 feet. This test had been looked upon as possibly connecting the producing areas of these two fields which are several miles apart.

New Tests Started

In La Salle Parish, the Gulf Refining Co.'s deep test, No. 1 Tremont Lumber Co., Section 10-9-2e, although not having encountered any showings of interest, is making good progress. The test is drilling in black shale at 4,868 feet. Natchitoches Parish, after being off the active wildcatting list for some time, has two new tests in operation. E. A. Keaton's No. 1 Stephens, Section 25-10-6, has set 12-inch casing at 178 feet, and the Mid-West Production Co.'s No. 1 Brown, Section 34-11-10, is drilling at 1,150 feet. In the Rhodessa Trinity gas field of northwestern Caddo Parish, the United Gas Public Service Co. is drilling in anhydrite at 5,320 feet on its No. 1 Bussa, Section 33-23-16, Same company's No. 11 Werner, D. B. Lewis Survey, a Trinity test 2 miles east of production in the Bethany Field of Panola County, East Texas, is in lime and shale at 4,916 feet. This test failed to make a gas well around the 4,700-foot level, where it is usually found in that area, and the operators are planning to drill to at least 5,500 feet.

Drilling in Arkansas

Most of the drilling operations in Arkansas are centered in Union County. The Lion Oil Refining Co.'s No. 9-A Hayes, Section 4-16-15, which first cored rock salt at 5,974 feet, is still in the same formation at 6,662 feet. The Drillers Oil & Development Co. in No. 1 Pickering, Section 1-17-16, has failed to shut off the salt water flow at 2,134 feet, and is plugging the bottom of the hole. About 3 miles west of the northern extension of the Urbana Field, Joe Modisett and others passed up a show of gas found in the Graves sand around 2,700 feet in their No. 1 East, Section 6-18-13, and are drilling to the pay horizon of the Urbana area around 3,600 feet.

In Mississippi

In Clarke County, Mississippi, the Gulf Refining Co.'s No. 1-A Long Bell Lumber Co., Section 10-2n-16w, which had a good show of oil at 3,700 feet in the Eutaw sand, is coring red shale at 4,150 feet. The only other active wildcat of interest in Mississippi is the United Gas Public Service Co.'s No. 1 Tchula Co-operative Store, Section 33-15-3e, in Warren County. The test is drilling at 3,474 feet.

Daily Average Runs

There was a net decrease of 40 bbls. daily in the average runs for the fields of North Louisiana and Arkansas during the week. Daily average runs for the several pools were:

NORTH LOUISIANA	
Caddo, light	6,195
Caddo, heavy	1,675
Cotton Valley	355
De Soto and Red River	2,150
Elm Grove	380
Haynesville	4,400
Holly	380
Homer	2,845
Pleasant Hill	380
Sarepta-Carterville	910
Urania	3,700
Zwolle	6,200
Total North Louisiana	29,570
Total previous week	29,615
Decrease	45
ARKANSAS	
Champagnolle	2,975
El Dorado	3,275
Lisbon	575
Nevada	1,175
Smackover, light	3,105
Smackover, heavy	23,965
Stephens	670
Urbana	910
Total Arkansas	37,750
Total previous week	37,745
Increase	5
Total both States	67,320
Total previous week	67,360
Decrease	40

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Rotary operations unless otherwise designated)

NORTH LOUISIANA

BIENVILLE PARISH

Company, farm and location—	Remarks:
Arcadia Drlg. Co.'s No. 1 Mason, Sec. 28-13-6, 1,200 ft. W, 190 ft. N, SE cor. NE NW	Drlg. 1,938 ft.

BOSSIER PARISH

Andrews & Davlin's No. 1 Nattin, 100 ft. N, 250 ft. W, C, Sec. 15-22-14	S.D. 2,890 ft.
Dr. W. N. Hankin's No. 1 Newell, 300 ft. S and W, NE cor., Sec. 12-19-11	S.D.; repairing boiler 1,700 ft.
D. L. Perkins' No. 1 Ardis & Co., 1,127 ft. N, 198 ft. E, SW cor., Sec. 13-15-11	S.D. 1,004 ft.

CADDO PARISH

D. C. R. Oil Co.'s No. 1 Oden account 5, Sec. 18-19-14, 430 ft. W, 280 ft. S, NE cor. SE	Rigging up.

CALDWELL COUNTY

Carter Bell's No. 1 Taylor, 150 ft. S, 150 ft. E, NW cor. NE SE, Sec. 17-14-4	Set 12-in. csg. 110 ft.
Hudson et al's No. 1 Burton, Sec. 35-12-2e	S.D. 2,950 ft.

CATAHOULA PARISH

National Drlg. Co.'s No. 1 Marsh McMillen, 70 ft. N, 100 ft. W, C, Sec. 26-9-6	T.A. 3,097 ft.

DE SOTO PARISH

Ben Merritt, tr.'s No. 1 Wallums, NE cor. SW SW, Sec. 19-12-12	Salt water; abnd. 2,930 ft.
E. T. Oakes' No. 1 R. H. Bryant et al, 200 ft. N and W, SE cor. NE NW, Sec. 30-13-15	S.D. 3,038 ft.
Rellitt Oil Co.'s No. 1 Ganno hrs., 300 ft. S and E, NW cor. NW NE, Sec. 12-11-16	S.D. 1,965 ft.
Walters-Nicholson, tr.'s No. 1 Jim Guy, Sec. 3-11-13	S.D. 1,266 ft.

LA SALLE PARISH

Gulf Ref. Co.'s No. 1 Tremont Lbr. Co., 665 ft. N, 632 ft. E, SW cor., Sec. 10-9n-2e	Drlg. black shale 4,861 ft.

(Continued on Page 65)

LOUISIANA-ARKANSAS PROVEN AREAS

NORTH LOUISIANA

CADDO PARISH—PINE ISLAND

Company, farm and location—	Remarks:
Shreveport Oil Corp.'s No. 2-B Muslow, 1,000 ft. S, 300 ft. E, NW cor., Sec. 32-21-15	S.D. 2,135 ft.
Simplex Oil Co.'s No. 1 Youree-Glassell, 500 ft. N and E, C, Sec. 13-20-15	Tested S.W.; S.O. 2,275 ft.

CADDO PARISH—RHODESSA AREA

United Gas Public Service Co.'s No. 1 H. J. Bussa, Sec. 33-23-16, 990 ft. W and 660 ft. S of NE cor.	Drlg. 5,320 ft.

MOREHOUSE PARISH

Bahan & Bahan's No. 4 Feazel, 900 ft. W, 300 ft. S, NE cor., Sec. 2-20-4	Location.

OUACHITA PARISH

Carbon Consolidated's No. 7 Guthrie, Sec. 50-20n-4e, 5,263 ft. N and 7,475 ft. W of cors. of Secs. 25, 26 and 49, in Sec. 50	Location.

RICHLAND PARISH

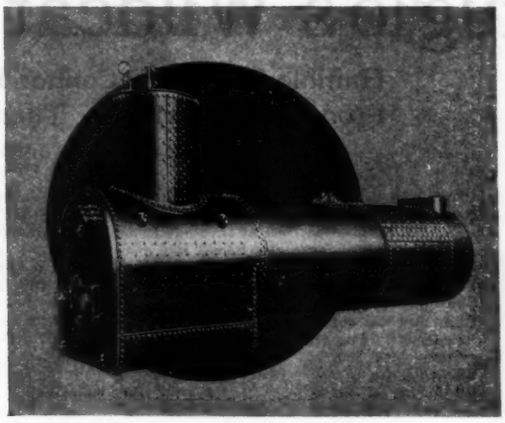
Pelican Nat. Gas Co.'s No. 1 Alexander, Sec. 4-16-6, 660 ft. N and W, SE cor. Sec.	Set 6-in. 2,300 ft.
Southern Carbon Co.'s No. 1 Pollard, Sec. 26-16-5e, 2,-710 ft. S and 563 ft. W of NE cor.	Dry and abnd. 2,480 ft.
Southern Carbon Co.'s No. 6 Rosengraut & Ducomb, 2,-640 ft. E, 1,980 ft. N, SW cor., Sec. 19-17-6	Location.
Southern Carbon Co.'s No. 8 Rosengraut & Ducomb, 2,546 ft. E, 660 ft. N, SW cor., Sec. 18-17-6e	Set 8-in. 916 ft.
United Gas Public Service Co.'s No. 5 Earle, Sec. 25-17-5e, 1,980 ft. E, 1,320 ft. S, NW cor.	Salt water; abnd. 2,704 ft.
United Gas Public Service Co.'s No. 14 Rhymes England, Sec. 32-17-6e, 392 ft. N, 663 ft. W, SE cor. section	Began Nov. 14; set 13-in. 174 ft.

SABINE PARISH—ZOWLLE

Crescent Drlg. Co.'s No. 1 McClannahan, Sec. 4-7-11, SE cor. SE NW	Derrick.

(Continued on Page 65)

No Detail Too Small for Consideration...



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Refugio's Wildcat Indicates New Field

Humble Test on O'Connor Ranch Showing for Well. Second Good Producer at Markham. Thompson Field Deep Sand Further Proved

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Nov. 23.—Chief interest in the Gulf Coast and lower coastal country is being centered on Humble Oil & Refining Co.'s wildcat on the O'Connor ranch in northeastern Refugio County which is showing for a well following a series of drill stem tests the past week. While the extent of the well cannot be determined at this time, the opening of a new field of considerable importance seems most probable as a result of the discovery.

This test, No. 1 O'Connor, at latest report was waiting casing with bottom of hole at 4,155 feet in shale streaked with sand. In a drill stem test at that level, the hole filled 800 feet with oil in 15 minutes. While having some shale breaks, the sand was topped at 4,112 feet. Two previous tests were made in sand at 4,127-39 feet. In the first run the oil filled 150 feet in 30 minutes and in the second 300 feet in 15 minutes. The oil tested 24.4 gravity, comparing with the 3,700-foot oil of the Refugio Field.

Exact location of the test is 6,012 feet south from the northeast corner along the southeast line of the Lon T. Rios Survey and thence 7,375 feet west at right angles in the John Keating Survey. This is on a large block, belonging to the Humble, which extends across into Victoria County. The well itself is just a short distance from the San Antonio River, the dividing line for Refugio and Victoria Counties.

The Humble block is just west and south of one held by The Texas Company in southwestern Victoria County and on which, a little over 2 miles to the northwest of the O'Connor well, The Texas Company early this year completed a gas well in a sand around 2,000 feet and on which another deep test, a half mile north of the gasser, is now drilling near 5,300 feet in exploration for oil after having passed up numerous gas sands.

Most Watched Area

This district extending into two counties has been one of the most watched areas on the Gulf Coast ever since it was blocked up during the active lease play which swept over the lower coastal country several years ago. Large adjoining blocks are held by the Humble, The Texas Company, United Gas Co. and Lion Oil & Refining Co., Houston Oil, Shell Petroleum Corp., T. B. Slick estate and others. While no oil has been found before, a gas-producing area of large extent and containing a multiplicity of sands has been uncovered or the existence of several different fields indicated. On the United Gas Co. and Lion block adjoining The Texas Company block and about 4 miles to the east of the latter's wildcat gas well, four gas wells have been completed in a 3,700-foot horizon, these constituting what is known as the McFaddin gas field.

Located 3½ miles to the north of the McFaddin Field, T. B. Slick estate has a wildcat gas producer, its No. 1 McFaddin, completed early this year in sand at a total depth of 3,512 feet. The Humble O'Connor well, itself, has passed up several gas sands and also experienced a blowout from one shallow sand in which it blew out of control for nearly a week.

In view of the similiarity of development in this area with that of the Refugio Field and other lower coastal fields, all at first having been high pressure dry gas fields, the discovery of oil in this part of Refugio and Victoria Counties has been looked upon as inevitable, and a second Refugio Field has been predicted. This area is some 15 or 20 miles up the coast line from the main Refugio Field and in a line with other such fields farther down the coast.

Second Markham Well

Developments in the salt dome district of the Gulf Coast during the week were marked by the completion of a second good producer in the recently opened flank sand on the northeast side of Markham, the addition of another deep sand well in the Thompson (Lockwood) Field, and the bringing in of a good well at Lake Barre, Terrebonne Parish.

At Markham, Powers Production Co.'s No. 1 N. R. Myers came in flowing 380 bbls. of pipe line oil in the first 19½ hours through a quarter-inch choke from sand at a total depth of 3,376 feet. In the sand, 25 feet 10 inches of 4¾-inch screen on 117 feet 3 inches of 4¾-inch blank was set with tubing to the top. Pressure shows 400 pounds on the tubing and 150 pounds on the casing. Gravity of the oil is 29.6 degrees with temperature of the well 60 degrees.

The Powers well is 210 feet north, slightly east of Ellis Hamill's No. 1 Meyers, discovery well of this sand, which in the sand at 3,242-63 feet was completed last July flowing 500 bbls. daily through a quarter-inch choke. That well since has been flowing steadily between 1,200 and 1,500 bbls. daily of pipe line oil.

These wells definitely prove up important production at Markham. While the dome has been productive since 1917, previous wells in shallower sands on top of the dome have been small and development has been more or less disappointing. The Texas Pipe Line Co. now is about half done with laying of a 4-inch pipe line to West Columbia which will be the field's first pipe line outlet.

Thompson Field

Cullen & West and Gulf Production Co.'s No. 3-A Lockwood & Sharp, Thompson Field, has further proved up prolific production of the deep sand recently opened at that field. This well, located on the north end, set 132 feet of 4¾-inch screen in sand at a total depth of 5,158 feet and came in flowing 140 bbls. on a three-quarters-inch choke. Production increased to 150 bbls. an hour. Tubing pressure is 390 pounds.

This well is 600 feet east of No. 2-A Lockwood & Sharp, completed several weeks ago flowing 3,500 bbls. daily from sand at 5,151 feet. As a result of these wells, the operators have started deepening their No. 1-A Lockwood & Sharp, discovery well of the field, which has been producing from sand at 3,089 feet, a sand in which Nos. 2-A and 3-A failed to make commercial wells. The discovery well is 800 feet south, 20 degrees east of No. 2-A. The deep sand also has been proved on the south end of the field over a half mile distant where the same operators' No. 2 George recently made a good well.

The addition of these wells is expected to bring the field's daily runs above 8,000 bbls. from six wells. Three of these wells are the deep producers while the other three are in a horizon at 3,500 feet. The field was opened last June.

Lake Barre's Eighth Well

At Lake Barre, Terrebonne Parish, The Texas Company completed its eighth producing well in its No. 11 State. This well, with 46 feet of 4½-inch screen at 3,806 feet, came in flowing 2,000 bbls. daily on an inch choke but was pinched back to a half-inch choke and now is making better than 1,200 bbls., 190 pounds pressure. This dome is one of seven geophysically discovered, which The Texas Company is developing in that parish, the field being located in the marsh land bordering the Gulf of Mexico.

In the same parish, Louisiana Gas & Fuel Co. (United Gas Public Service Corp.) still is waiting casing to test its No. 2 Minor, a rank wildcat, which on a drill stem test early in the week showed for a dry gas well in a sand topped at 3,778 feet and which was cored to 3,882 feet. The latter is 3,480 feet south and 1,980 feet east of the northwest corner of Section 3-18s-16e, approximately 7 miles southwest of the town of Houma and about 15 miles northwest of the old Houma gas field. In the latter field a number of gas wells have been completed although salt water intrusion has drowned these out and at present there is no commercial production. The Minor well is on a large block acquired on the strength of geophysical exploration indicating either a dome or "high."

East Hackberry

The north extension of East Hackberry, Cameron Parish, yielded another producer in Yount Lee Oil Co.'s No. 46 State, which, in sand at a total depth of 2,990 feet, came in flowing at the rate of 675 bbls. daily through a three-eighths inch choke. At Hull, Republic Production Co. got a 600-bbl. well in No. 144 Dolbear in a 1,300-foot horizon. The hole had been drilled to 1,852 feet in rock. Rio Bravo Oil Co.'s No. 21-A Cotton, Saratoga, made 10 bbls. at 660 feet.

Humble Oil & Refining Co. failed to make a well in its No. 2 Cockrell-Moran, Lake Grand Ecaille Dome, Plaquemines Parish, Louisiana, and abandoned it with the bottom in salt topped at 1,574 feet. This company's No. 2 Irvin, deep test at Mykawa, south of Houston, also has been abandoned. This well has been showing considerable gas with bottom of hole at 6,401 feet but with drill pipe lost the hole has been junked.

May Be Deepest Producer

Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, deep test southeast of the Jennings Field, set 58 feet of 5-inch screen at 7,828 feet to test sand showing oil and gas but bailed dry. At latest report it was preparing to swab. If this makes a well it will be the deepest producer on the Gulf Coast.

Sun Oil Co.'s No. 25 Bender, northwest flank extension test at Humble, was put on the pump during the week but is making only water. This test drilled to salt at 3,268-98 feet and plugged to a sand at 2,850 feet where five joints of 4½-inch screen were set. No. 26 Bender, 310 feet west 20 degrees north of No. 25, was drilling sticky shale at 2,129 feet late in the week.

GULF COAST FIELDS AND WILDCATS

Week Ended November 21
All Rotary

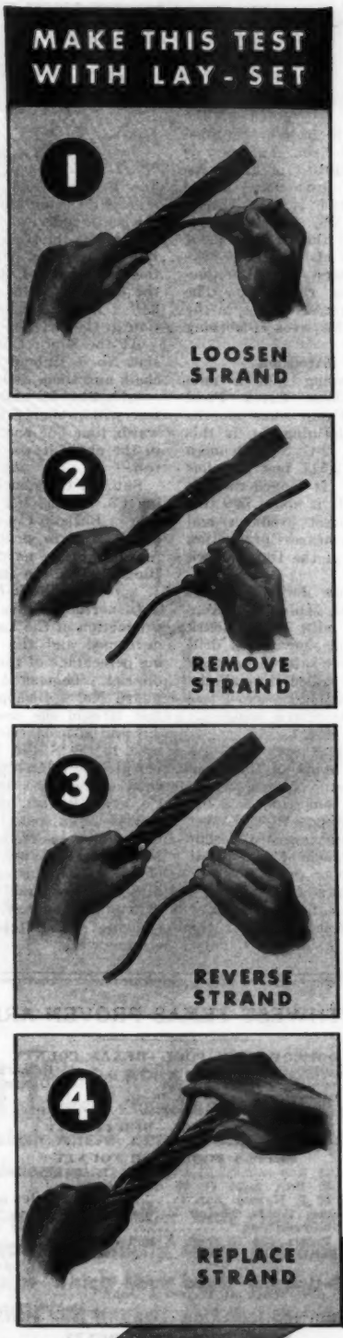
BARBERS HILL—CHAMBERS COUNTY

Company, farm and location—	Remarks—
Mills Bennett Prod. Co.'s No. 1 Gulf fee, Henry Griffith League, 50 ft. out of NE cor., Strip 15	Drlg. hard shale 4,118 ft.
Mills Bennett Prod. Co.'s No. 6 Wilburn, Henry Griffith League, 125 ft. W of No. 5 in center of tract	Drlg. lime rock 1,362 ft.
Mills Bennett Prod. Co.'s No. 5 Gulf-Fisher, Wm. Hodges Sur., 75 ft. from N line, 191 ft. W of No. 4	Rock 963 ft.; cmtd. 18⅝-in. csg. on bottom.
R. E. Ferrell's No. 2 Wilburn, Henry Griffith League, 215 ft. W of No. 1 in center of 45-acre tract	Spudded.
Gulf Prod. Co.'s No. 6 Wilburn, Henry Griffith League, 50 ft. from S line of lease and 400 ft. W of No. 3	Drlg. salt 2,307 ft.; top of salt 1,426 ft.
McAlbert Oil Co.'s No. 2-A Higgins, Wm. Bloodgood Sur. (W.O.)	Set 22 ft. of 3-in. screen 5,230 ft.
Nat Hunter Prod. Co.'s No. 2 Tarbutton, Henry Griffith League, 385 ft. from E line and 21 ft. from N line of tract	Total depth 5,643 ft.; sidetracked to 3,506 ft.; set 31 ft. of 6-in. screen; comp. flowing 860 bbls. 24 gravity oil.
Nat Hunter Prod. Co.'s No. 3-B Barber, Henry Griffith League, 538 ft. from E line, 70 ft. from S line of tract	Drlg. shale 4,343 ft.
Nat Hunter Prod. Co.'s No. 1 S. E. Morgan, 225 ft. N of S line in center of Strip 2 (4.4 acres), Henry Griffith League	Drlg. anhydrite 1,223 ft.
Nat Hunter Prod. Co.'s No. 1 J. M. Fitzgerald, Henry Griffith League, 75 ft. from W line and 125 ft. from S line of tract	Derrick.
Sinclair Oil & Gas Co.'s No. 9 Wilburn, Wm. Hodges Sur., 50 ft. N of S line and 550 ft. W of No. 6	Drlg. lime rock 1,456 ft.
Sinclair Oil & Gas Co.'s No. 10 Wilburn, Wm. Hodges Sur., 50 ft. S line, 100 ft. W of No. 9	Drlg. broken sandy lime 1,002 ft.
Sinclair Oil & Gas Co.'s No. 11 Wilburn, Wm. Hodges Sur., 125 ft. W of No. 8 and 45 ft. S of N line	Drlg. sandy lime 1,034 ft.
Sun Oil Co.'s No. 2 Higgins, Wm. Bloodgood Sur., 1,095 ft. W of No. 1 and 50 ft. N of S line	Spudded.
Sun Oil Co.'s No. 3 Smith (W.O.), W. D. Smith Sur.	To pump 5,320 ft.
Sun Oil Co.'s No. 12 Wilburn, Wm. Hodges Sur., 50 ft. from N line and 75 ft. W of No. 11	Rock 1,489 ft.; losing returns.
Sun Oil Co.'s No. 2 Winfree (W.O.), W. D. Smith Sur., 50 ft. from SW line and 150 ft. of S line	Rig up to workover 5,359 ft.
The Texas Company's No. 7 Wilburn, Henry Griffith League, 116 ft. S of Humphreys Corp.'s No. 8-H Kirby	Running tubing; T.D. 4,422 ft.
The Texas Company's No. 2 Lawrence, Henry Griffith League, 240 ft. from E line and 412 ft. from N and S lines of strip	Drlg. sandy shale 4,301 ft.

HUMBLE—HARRIS COUNTY

Southern Coastal Oil Co.'s No. 3 Perkins, John Jones Sur., 150 ft. N of No. 2	Derrick.
Sun Oil Co.'s No. 25 Bender, W. B. Adams Sur., 1,155 ft. from C of R.R. on an extension of the N line of the Bender North Addition and 8 ft. S	Salt 3,268-98 ft.; plugged to 2,850 ft.; set 111 ft. of 4½-in. screen; pumping water.
Sun Oil Co.'s No. 26 Bender, W. B. Adams Sur., 310 ft. W. 20 deg. N of No. 25	Drlg. sticky shale 2,129 ft.
The Texas Company's No. 37 Koehler, J. B. Stevenson Sur., 717 ft. E and 603 ft. S of NW cor. of SW fee tract	Drlg. shale, boulders and lime 3,587 ft.

(Continued on Page 68)



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Operations Pick Up in Balcones Fault Zone. Darst Creek Extended and Three New Locations Made in South End of Field

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Nov. 23.—Houston Oil Co. partly redeemed the southwest extension to the Pettus Field last week when No. 2 Portias, an east offset to the Damac discovery well, topped the sand at 3,898 feet, a little high, and on drill stem test filled 15 joints with oil in 12 minutes through three-eighths-inch choke. It has set casing and looks like a good well. However, the field has not much of an opportunity to spread to the east. Mauldin's No. 1 fee, which failed to make a well thus far, is 2,000 feet northeast and the Houston Oil Co.'s No. 1 Portias, a dry hole, with total depth 5,000 feet, is 3,000 feet a little north of east and William F. Morgan's No. 1 Ray, a dry hole with total depth 4,500 feet, is 2,500 feet southwest.

The Weinert dry hole to the southwest of the Damac discovery well is still unexplained. It had 3 feet of sand at 3,929-32 feet but on drill stem test with total depth 3,940 feet it made salt water. From 3,932-35 feet it had shale and it is possible it drilled too deep and might have had some oil in the 3 feet of sand. It is contining to drill and was last reported below 4,300 feet.

One theory is that this test, which is about 150 feet north of a straight line between the Damac discovery well a quarter of a mile northeast and the Buchanan & Lefevre producer a quarter of a mile southwest, is just out of line enough to get on the wrong side of the fault and that another location south would have been a producer. W. L. Morgan is rigging up on a location a little south of Weinert and will soon test the theory.

In the meantime The Texas Company is rigging up for No. 1 Gremmel, 150 feet from the south and east lines of the south John Pace Survey, constituting a northwest offset to the Buchanan & Lefevre well.

Balcones Fault Zone

Operations have picked up perceptibly in the Balcones Fault zone. Wheeler in western Lee County near Lexington is drilling again and that territory is being watched with considerable interest. The Red Bank Oil Co. has spudded in another test in eastern Milam County on the Foster farm. In Caldwell, Lloyd North of Houston has taken over Ralph R. Lewis' No. 1 Keith McGee, southwest of Dale in the eastern part of the county, which has been standing after spudding in and setting one joint of pipe. It has now started drilling.

In western Caldwell, where M. O. Rayor completed one small well 2½ miles northeast of the town of Luling and the same distance southeast of the Luling Field, he has started drilling another one location southeast of the producer and is down around 2,000 feet and ought to reach the pay this week. The first well was completed at 2,480 feet. If his efforts open up anything it will be a new pool parallel and between the old Luling and the Joe Bruner Pools. His first producer heads every two days and makes about 15 bbls. of oil but is not down to the Edwards. It may be an edge proposition.

The feature of the week in the Balcones Fault zone is Pray and Campbell's No. 1 Krueger which seems to be running a little high and has a showing of oil in the top of the Buda at 2,326 feet. It topped the chalk at 2,150 feet and had base of chalk at 2,305 feet.

This test is approximately a half mile northeast of W. J. Walton's No. 1 Zoborolski, which is flowing 8 bbls. daily from the chalk topped at 2,183 feet and total depth 2,210 feet. The Walton test is south of the Guadalupe River and the Pray and Campbell test north of the river. It is thought to look pretty good for an Edwards lime field. This test is about 2½ miles northwest of an extension of the axis of production of the Darst Creek Field and M. W. Eiser's No. 1 Wells is about 2½ miles southeast of the same axis and the first is about 3 miles and the other about 5 miles farther southwest of Darst Creek production. Eiser is getting rigged up. The Pray and Campbell test should be in the Edwards lime early this week if nothing unfortunate happens.

Darst Creek Extension

In the new producing spot a mile southwest of the Darst Creek Field opened by John F. Camp some months ago Humble Oil & Refining Co. is this week completing No. 2-C Sue Denman which set casing at 2,517 feet and has total depth 2,523 feet. It topped the Edwards at 2,522 feet. It is about 500 feet northeast of the nearest producer and in the direction of the nearest production at the southwest end of the Darst Creek Field.

The Saxet Field has developed little during the week. Neal, Milton and Kepley are still working with No. 1 Roark that made such a good showing on drill stem test but later made salt water when casing was set. They milled through the casing and went down for a second test and got a little oil but it also made salt water.

In the coast country Stanolind's No. 1 Stratton, a few miles south of the Agua Dulce Field in western Nueces, which has been standing for some time at 4,765 feet, has resumed drilling. At 4,752 feet it made a little gas spraying gasoline but not enough to make much of a well. It seemed to call for deeper drilling.

Drilling in Darst Creek

The Texas Company has made three locations in the southwest end of the Darst Creek Field in Guadalupe County, the locations being on the Henry Willis, Lemmie Anderson and Ralf Paris leases.

John Storey is getting ready to dri No. 1 Dickerson at the north end of th Joe Bruner Field and Joe Bruner ha started to complete his No. 1 Malone the south end. For months there has bee no activity in the county. Storey's loca tion is 150 feet north of the center the south line of the Dickerson tract i the John D. Rains Survey and is abou half a mile north of the nearest produc tion in the field.

At the south end of the field Brune shot No. 1 Malone with 40 quarts in th chalk and Buda and cleaned out. It baile considerable oil and water broke in. Th test will probably be carried to the E wards lime but had such a good showin in the chalk it was thought advisable t test.

Sun Oil Co. and Humble Oil & Refi ing Co. are moving in derrick to a loca tion in Bastrop County north of the tow of Bastrop to drill No. 1 Powers, 4 feet from the north and east lines Block 197 of the Bastrop town tracts.

Schoolfield-O'Byrne Pool

In northern Duval County most of th production of the Laredo district is bein developed and the pool is producing big percentage of the production from th district. Thomas & Tarver, Inc., com pleted No. 4 Bishop Cattle Co. at 2,30 feet late in the week for 500 bbls. p day initial production and 8 miles nort west in the S.R.C. Pool in northweste Duval the S.R.C. Oil Co. and Vacuu Oil Co. completed their No. 6 Duval Lan Co. at 1,746 feet for 200 bbls. of oil.

There was some little delay in gettin casing out to Thomas & Tarver, Inc. No. 1 Welder-Wood in the northern pa of Duval but casing was set last wee at 2,156 feet and it is about ready t drill plugs and test. It had such a goo showing of oil it is to be watched th coming week.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

ATASCOSA COUNTY

Company, farm and location— Remarks:
Glen Mathis' No. 2 Mrs. C. Martin, 100 ft. SE of No. 1.. T.D. 2,980 ft; S.D.

BLANCO COUNTY

Hardy-Sitton's No. 1 McMillan ..... T.D. 602 ft; S.D.
Theo. Hicks' No. 1 Specht, 1,500 ft. from S line, 500 ft. from W line of farm, in Thomas M. Fowler Sur. No. 27 in extreme south point of county ..... T.D. 1,650 ft.; S.D.
Lilies Adams et al's No. 1 Luders, 150 ft. to S line, 1,420 ft. to E line of James Stanford's No. 155..... T.D. 1,100 ft; standing.
McCleary et al's No. 1 Schenling, 900 ft. to SE line, 600 ft. to S line of J. A. Rouse No. 118 Sur., 4 miles SW from Blanco City ..... T.D. 574 ft; S.D.
C. Rosenfield's No. 1 Hohenberger, 300 ft. to W line, 1,260 ft. to N line, Sur. No. 94 ..... T.D. 712 ft; S.D.

BASTROP COUNTY

Texas Dev. Co.'s No. 1 C. H. Ray, 300 ft. from W line and 400 ft. from S line of farm, in Thos. Christian Sur. ..... T.D. 2,508 ft.; drlg.

BELL COUNTY

Bridwell et al's No. 1 G. A. White, 550 ft. to E line, 150 ft. to S line of farm, Nancy Roberts Sur., 4 miles SE from Belton ..... Location.
Bridwell et al's No. 1 Witter, 2,500 ft. to W line, 1,800 ft. to S line in Margarite Frazier Sur. ..... T.D. 1,000 ft.; flow, fresh water.
Field & Lange's No. 1 Stubblefield, 450 ft. from S line and 150 ft. from E line of farm in Antonio Manchaca Sur. ..... T.D. 410 ft; drlg.
J. W. Riley's No. 1 W. S. Chaffin, in M. Griffin Sur. .... T.D. 365 ft.; drlg.
Jas. Scroggins' No. 3 Warrick, Ingram Sur. ..... T.D. 1,425 ft.; no report.

BEE COUNTY

Alexander et al's No. 1 McFall, 3 miles S Skidmore..... T.D. 1,870 ft; standing.
Humble O. & R. Co.'s No. 1 Laura Thompson, 6,360 ft. from N line, 15,100 ft. from W line of tr. in Garrett Roache Sur., S part of county ..... T.D. 3,622 ft.; drlg.

BEXAR COUNTY

J. E. Anderson's No. 1 Suburban Irrigated Farms, 500 ft. to N line, 600 ft. to E line of C. Logan Sur. ..... T.D. 1,368 ft.; bailing, shows oil.
Callahan Final Oil Co.'s No. 1 B. H. Buck, 900 ft. to E line, 3,200 ft. to S line of farm, in J. M. McGamley Sur. ..... T.D. 350 ft.; drlg.
Ingersoll-Miller's No. 2 Carruth, 3,900 ft. S, 2,500 ft. W of NE cor. of tr. in Francisco Bolen Sur. ..... T.D. 480 ft.
Dr. Ewell Neil's No. 1 J. Watson, 500 ft. from W line, 1,700 ft. from S line of B. Martinez Sur. ..... T.D. 2,200 ft.; drlg. chalk.
Schneider, Rees et al's No. 2 Claussen, 12 miles NE of San Antonio ..... T.D. 1,150 ft.; drlg.

(Continued on Page 67)

SOUTHWEST TEXAS PROVEN AREAS

DOBROWOLSKI POOL—BEXAR COUNTY

Company, farm and location— Remarks:
Williams et al's No. 2 Strunk, Juan Montes Sur. ..... Location.
Witherspoon Oil Co.'s No. 2 Ramzinski, 330 ft. to W line of tract, 660 ft. S of No. 1 Ramzinski..... T.D. 1,500 ft.; drlg.

NORMANNA POOL—BEE COUNTY

C. F. Nichols' No. 1 Hicks ..... T.D. 1,992 ft.; rigging to deepe

PETTUS POOL—BEE COUNTY

C. R. M. Drlg. Co.'s No. 1 Ray ..... Making location.
United Prod. Co.'s No. 39 Ray, 1,130 ft. to SE line, 2,396 ft. to SW line of T. Hanson Sur. ..... T.D. 7,106 ft.; drlg.
H. H. Weinert's No. 1 Ray, 150 ft. N and E lines of lease in Jno. W. Williamson Sur. ..... T.D. 4,300 ft.; drlg.
Houston Oil Co.'s No. 2 Portis, 330 ft. from N and W lines of A. Smalley Sur. ..... T.D. 3,905 ft.; set csg.; drill ste test showed 15 joints oil.
W. L. Morgan et al's No. 1 Ray, 150 ft. to N and W lines of 10-ac. lease, next south of Weinerts, John W. Williamson Sur. ..... Making location.
The Texas Company's No. 1 E. Gremmel ..... Derrick.

SIMMS POOL—BEE COUNTY

Al Buchanan's No. 1 Mary Doreenfield in John Lyford Sur. ..... Making location.
Hughes et al's No. 1 Martin, 1,000 ft. S of Simms Oil Co.'s No. 1 Holsmark in John Lyford Sur. ..... T.D. 1,554 ft.; drlg.

BRUNER POOL—CALDWELL COUNTY

Joe Bruner's No. 1 Malone, 150 ft. to N line, 750 ft. to W line of tr., A. Floyd Sur. ..... T.D. 2,572 ft.; bailed oil after sh water broke in.
John Storey's No. 1 Dickerson, 150 ft. to N of center of S line of tract, John R. Rains Sur. ..... Location.

S.R.C.-VACUUM POOL—DUVAL COUNTY

S.R.C. and Vacuum's No. 6 Duval Land Co., 150 ft. W. 450 ft. N of No. 5, Sur. 293 ..... Drilling.

SCHOOLFIELD-O'BYRNE POOL—DUVAL COUNTY

Duval Oil Corp.'s No. 6 Bishop Cattle Co., 1,980 ft. to W line, 990 ft. to S line of N half of Sur. No. 135.... T.D. 2,335 ft.; set csg.
Magnolia Pet. Co.'s No. 6 Wilson, 330 ft. to E line, 2,346 ft. to N line of Sur. No. 136 ..... T.D. 2,300 ft.; set csg.
Magnolia Pet. Co.'s No. 5 Wilson, 330 ft. from N line W line, 330 ft. from S line of Sur. 135 ..... T.D. 2,316 ft.; set csg.
Thomas & Tarver's No. 4 Bishop Cattle Co., 1,175 ft. E of W line, 300 ft. N of S line, Sec. 135 ..... T.D. 2,300 ft.; set csg.

COLE POOL—DUVAL COUNTY

Cole Petroleum Co.'s No. 71 Benavides, 365 ft. from SE line, 442 ft. from NE line of Blk. 8, Sec. 19, Cole sub. Mariana Arispe grant ..... T.D. 1,757 ft.; bailing.

(Continued on Page 66)

INDUSTRY'S IDEAL PIPE

HERE'S a point which should not be overlooked when considering pipe for service of any kind where corrosion is an important factor in determining pipe life.

Everyone familiar with pipe knows that rust and corrosion usually attack first those parts of ferrous pipe which have been worked cold, such as cut ends and threads, and that the maximum resistance to attack is usually at the surface of the metal.

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Colorado Cheered by New Oil Showings

Prairie and Greely Companies' Tests Considered Favorable; Resumption of Wildcatting in Southeastern Mexico in Spring

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Nov. 23.—An optimistic atmosphere was apparent among oil men in Colorado this week as a result of the Prairie Oil & Gas Co.'s No. 1 Mortier, 6 miles southeast of the Greasewood Pool, finding oil in the Muddy sand and a show in the top of the Dakota, and the Greeley Oil Co.'s No. 1 Gadbois, two-thirds of a mile southwest of the nearest Greasewood producer, finding the Muddy sand saturated when cored. The Colorado Associated Oil Co.'s No. 1 Pumphrey, north of Fort Morgan, is being drilled a little deeper. One new operation, a shallow test, was reported in Weld County.

OIL COMPANY HEAD DIES IN HOSPITAL AS WELL COMES IN

Floyd Clark, president of the Federal Oil Co., died in a hospital in Alliance, Neb., this week just as the well he was drilling came into production. He lived long enough to learn that his efforts to establish a producing company had been rewarded with success and next day he passed away. The company's well, No. 1, NE SE Section 15-46-64, Osage Field, Weston County, Wyoming, picked up the sand at 2,074 feet and filled up 1,800 feet in two hours. It was then shut down for tankage. Mr. Clark was informed just before his death that it looked like it would be the best producer so far completed west of Beaver Creek. His death was the third of heads of companies in the Rocky Mountain area within the past few weeks just as their operations were at a critical point. Nettie M. Slatt, who was drilling a well near Watkins, Colo., died just as the hole had reached an interesting depth and began to give indications of being a producer. Charles A. Caruson, head of the MacDeb Drilling Co., wildcatting in the same district, died believing that his No. 1 Fitzsimmons was within a few feet of a productive sand.

The Continental Oil Co.'s pipe line from Greasewood to Hardin is under construction.

Indications point to a resumption of wildcat drilling in southeastern New Mexico in the spring. The Gypsy Oil Co.'s No. 1 Grimes, Hobbs Pool, was given a potential of 2,657 bbls. of oil and 3,500,000 feet of gas upon being drilled a little deeper. The Continental Oil Co. completed a 75-bbl. well in the shallow sand on the Rattlesnake Dome.

L. B. O'Neil's No. 1 McNeil, Cut Bank gas field in Montana, was completed for 8,000,000 feet per day, extending the proven area 2 miles to the south and east. Two new operations in Carbon County were reported. A 2,000,000-foot gas well was completed in the Kevin-Sunburst Field.

The Producers & Refiners Corp.'s deep test on Big Sand Draw Dome, Fremont County, Wyoming, was completed as a 65,000,000-foot gas well in the Morrison, proving a deeper horizon. One well west of Beaver Creek, Osage Field, was being completed. The Ohio Oil Co.'s Neiber Dome test found the Muddy sand dry at 8,413 feet and is going deeper. The Midwest Refining Co.'s No. 24 Rosenberg, at Frannie, pumped 500 bbls. initial and extended the pool one-fourth of a mile.

COLORADO

Weld-Morgan Counties

The wave of pessimism which swept over the oil men when the Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, in the Greasewood Field, proved a failure in the Muddy sand and the Colorado Associated Oil Co.'s No. 1 Pumphrey, in Morgan County, did not come up to expectations, was dissipated to a large extent this week with favorable news from two important wildcats in this general area. These were the Greeley Oil Co.'s No. 1 Gadbois and the Prairie Oil & Gas Co.'s No. 1 Mortier, both of which showed saturation in the Muddy sand and give promise of being producers.

Prairie Oil & Gas Co.'s No. 1 Mortier, C NE NW Section 2-5n-60, Jackson Lake district, in Morgan County, 6 miles southeast of the Greasewood Pool, started coring at 6,449 feet and at 6,464 feet picked up the top of the Muddy sand, the producing formation at Greasewood. The sand was cored to the bottom and showed a thickness of approximately 25 feet. The core, which was not recovered in its entirety, showed oil and gas saturation. While officials expressed opinion that the showing was as good, or better than in the same formation at the same stage of drilling in the Greasewood wells, it was decided to continue down to test the Dakota. The Dakota was picked up at approximately 6,533 feet and was cored 3 feet. The interval between the two sands was 44 feet, or about 20 feet less than expected. The core from the top of the Dakota showed some saturation, but not very much. However, the formation was very hard and when the bit was run to ream the hole no progress could be made below the bottom of the core hole. The core bit then was run again and at last reports coring was in progress in the Dakota, but the core had not been removed from the hole. Plans for making a test have not yet been announced and probably not decided upon, pending the determining of results in the Dakota. There is a possibility that before any test is made the hole will be cored to the Lakota and possibly deeper. The only casing in the hole, outside of the conductor pipe, is the 9⅝-inch cemented at 5,175 feet.

Prairie Discovery

The discovery of oil in the Prairie well 6 miles southeast of the Greasewood Pool raises the question whether it is a separate pool or is connected with Greasewood. This probably will be a matter of opinion until additional wells are drilled as no holes have been put down in the intervening space and opinions vary as much as ever as to the trend of the Greasewood Dome, if such it proves to be. Since the Dakota has not been tested at Greasewood, the available data are based on the wells drilled to the Muddy and this shows that formation to be rather erratic as to thickness and considerably broken in character. There is a doubt as to structural conditions at Greasewood and some geologists express opinion that the production is coming from sand lenses that have been sealed. On the contrary, the Dakota is a blanket sand extending over a vast area and more dependable as to thickness and character.

The Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl at Greasewood is being deepened to the Dakota and when the results are known there will be more light on the subject. The Prairie's No. 1 Mortier has an elevation of 4,657 feet and the Muddy was topped 1,807 feet below sea level, or 170 feet higher than in the discovery well at Greasewood. It topped the Niobrara at 6,029 feet and had a good show of oil in that formation. Several officials of the Prairie company, of Wyoming, were present at the well, including A. G. Dana, vice president, and C. G. McCoy, general superintendent.

Ranking next in interest to the Prairie well is the Greeley Oil Co.'s No. 1 Gadbois, C NW NW Section 25-6n-61, at Greasewood, a little more than three-fourths of a mile to the south and a little to the west of the Platte Valley. Petroleum Co.'s No. 1 Patterson, the discovery well. It cored the Muddy sand at 6,676-98 feet and found it saturated and containing some gas. There is a question as to the exact top of the sand, some measurements placing it 6,670 or 6,67 feet. However, the saturation began to show at 6,676 feet. The 7-inch has been run and cemented at 6,671 feet. The sand was cored with a 6⅝-inch cone and not much delay is expected in bringing it in. At first there was some question whether there will be sufficient gas to flow the well, but when the pipe was being lowered and the water agitated there were indications it had considerable pressure. The top of the Muddy was found 37 feet lower than in the discovery well nearly a mile to the north and the sand is 22 to 23 feet thick as against 31 feet in the discovery well and 10 fee in the No. 1 Johnson-Juhl.

The Continental Oil Co.'s No. 1 Gadbois, C SE SW Section 24-6n-61, one-third of a mile to the northeast of the Greeley company's well and between it and the discovery, is still held up at 6,593 feet with a fishing job, the drilling string and a fishing string being in the hole. While efforts to clear the hole are continuing, the outcome still is in doubt.

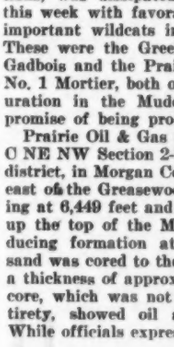
Reiter-Foster Oil Co.'s No. 1 Johnson-Juhl, C SE SE Section 14-6n-61, half a mile to the west of the nearest producer and 1¼ miles north of Greeley's No. 1 Gadbois, is bottomed at 6,734 feet, 5 feet below the Muddy, and drilling towards the Dakota. It has been troubled with cavey ground and has made no progress the past week. The cave has been cemented and drilling with cable tools will be resumed within a day or two. The interval between the Muddy and Dakota varies in different areas from a few feet up to 80 feet. In the Prairie Oil & Gas Co.'s No. 1 Mortier, 6 miles southeast, it was 44 feet. The Johnson-Juhl found only 10 feet of Muddy sand at 6,888-98 feet and it contained water. This is the only well being drilled to the Dakota.

The Ohio Oil Co.'s No. 1 Gadbois, C SW SE Section 24-6n-61, an east offset to Continental's No. 1 Gadbois, has tanks up and camp completed, and heavy rotary

PROMISING SHOW OF CRUDE FOUND IN MILK RIVER, ALBERTA DISTRICT

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Nov. 21.—In the southern plains area of Alberta, west of Milk River, Parco Oil Co.'s No. 1 Twin River, LSD 16, Section 34-1-20w4, drilled into a promising show of crude oil in the top of the Madison limestone at 3,880 feet. The oil was accompanied by some gas. The strike is regarded as one of the most important developments yet recorded in the border fields. Parco Oil Co., Ltd., is controlled jointly by the Producers & Refiners Corp. and the Prairie Oil & Gas Co. The test was a joint enterprise of the Parco company and the Nordon Corp., located on acreage leased by Nordon. The Nordon interests hold some 13,000 acres on the Twin River structure, the acreage being selected and leased in 1929 by the Nordon geological staff headed by R. F. Hake. The structure was thoroughly core drilled before the commercial test was started, J. S. Irwin of the Parco Oil Co. being associated with Mr. Hake in this work. The commercial test was started on July 1 and was the first venture undertaken by the Parco Oil Co. or the Nordon Corp. in Alberta. Drilling was in charge of Charles Mead of the Mead-Phillips Drilling Co.



The test is between the north and south forks of Milk River, about 15 miles from their junction and 6 miles north of the Montana boundary. No important showings were reported until the drill reached the top of the Madison. The test was carried a few feet into the Madison. The bailer was run five times in an hour without lowering the crude in the hole, and unofficial reports indicate a possible production of 100 to 150 bbls. a day. The crude is a light brown product of about 31.5 gravity, and is accompanied by about 500,000 feet of gas. The 8¼-inch casing is being cemented on top of the lime after which the well will be drilled into production. The showing was encountered in practically the same horizon as that recently encountered in Hudson's Bay Oil & Gas Co.'s No. 1 Keho in LSD 2, Section 17-11-22w4. According to the geologists, geological conditions in both these wells indicate the structure bears no relation to the Red Coulee Field, entirely different results being obtained in the formations already drilled. Hudson's Bay Oil & Gas Co. holds Section 26 diagonally southeast of Section 34; and in the adjacent Shank Lake area, Alberta Pacific Consolidated Oils, Ltd., Multi-Structure Oils and Madison Oils hold considerable territory. The Shank Lake structure is west of and parallel to the Twin River structure.

Imperial Drilling

The showings encountered at the Ellis-Madison contact in the Twin River and Keho Lake areas lend interest to the Texas-Imperial No. 1 wildcat now drilling in LSD 14, Section 22-8-22w4, on the Lethbridge structure. Texas-Imperial's No. 1 is now drilling in the Sunburst sand around 4,231 feet. It is apparently more than half way through the Sunburst, estimated 60 feet thick, and below this is about 200 feet of the Ellis. Both are potential oil and gas horizons, while the Twin River and Keho Lake tests have encountered good shows at the Ellis-Madison contact.

In South Turner Valley, Sterling Pa-

(Continued on Page 72)

rig used in drilling the Porcupine Dome test in Montana for the Prairie Oil & Gas Co. is on the ground. The Noble Drilling Co. has the contract. Same company's No. 2 Gadbois, C NE NW Section 25-6n-61, an east offset to Greeley Oil Co.'s No. 1 Gadbois, remains a location.

Reiter-Foster Oil Co.'s No. 1 William Wilson, C NE SE Section 24-6n-61, half a mile southeast of the discovery well, is bottomed at 420 feet and cleaning out at 318 feet. It is being drilled with a spudder until rotary equipment is released from the Johnson-Juhl well.

Colorado Associated Oil Co.'s No. 1 Pumphrey, C SE SE Section 14-4n-58, North Fort Morgan Dome, bailed fluid to within 500 feet of bottom and shut in the well. It built up a pressure of 55 pounds and gauged 50,000 feet of gas. It is making about 3 bbls. of water per hour. It was then decided to go back into the hole and core it 5 feet deeper and then test to determine whether the water is coming from he bottom or from behind the pipe. The hole is 15 feet in the Dakota at 5,845 feet. The 22 feet of Muddy had only a show of gas. The intervals between the Muddy and the Dakota was approximately 49 feet.

Indian Territory Illuminating Oil Co.'s No. 1 State, C NE NE Section 16-1n-57, South Fort Morgan, plugged back from 5,905 feet to 5,596 feet and is waiting for cement to set. It will drill out the iron at the bottom.

One new operation in Weld County was reported in the Associated Farmers Development Co.'s No. 1 Schmeekle, NW NE NW Section 3-7n-56, near New Raymer. It spudded in an 8-inch hole for a test to 700 feet and is shut down changing rigs. James Farrell, of Bushnell, Neb., is head of the company.

The Prairie Oil & Gas Co.'s No. 1 O'Toole, C SE NE Section 33-7n-62, 19 miles northwest of Greasewood, cemented 15½-inch at 157 feet and is drilling below 3,850 feet.

Arapahoe County

MacDeb Drilling Co.'s No. 1 Fitzsimmons, NE Section 7-4s-66, near Aurora, jumped a pin and has 4 feet of the bit in the hole at a total depth of 5,850 feet. The bottom was cemented with 10 sacks and the iron will be drilled up.

Adams County

Hills Dome Lease Development Co.'s No. 1 Hills, SE cor. Section 27-3s-64, near Watkins, is rigging up to resume at 3,745 feet under contract awarded to the Siler Drilling Co. to carry the hole to 6,000 feet.

Larimer County

Raddatz Corp.'s No. 2 State, SW cor. NW Section 16-4n-69, Berthoud Dome, is being put on the pump. Same company's No. 2 Fagan, NE SE NE (cor.) Section 17-4n-69, is drilling at 1,000 feet in blue shale.

Mayer Oil Co.'s No. 1 Reed, SW cor. NW Section 28-4n-69, is underreaming the 6⅝-inch at 2,100 feet.

P. J. Mosher, Inc.'s No. 1 Mead, SW SE Section 17-4n-69, is moving out machine to install standard rig.

Park County

South Park Oil Co.'s No. 1 Milligan, NE cor. SE Section 13-8s-76, near Jefferson, is shut down for parts at 2,605 feet, and South Park Oil & Gas Co.'s No. 1 Esche, SE cor. NW Section 5-9s-76, is bottomed at 2,495 feet and preparing to sidetrack spear.

Routt County

Mid-Colorado Petroleum Co.'s No. 1 Omholt, NE cor. SE Section 29-4n-87, Fish Creek, is drilling below 1,500 feet.

Rio Blanco County

Magnolia Petroleum Co.'s No. 1 Maddock, C NW SE Section 9-2s-96, Piceance Creek, set the 10¾-inch at 2,031 feet for a formation shutoff. The California Co.'s No. 1 California-Raven, Section 30-2n-102, Rangely Dome, is drilling at 3,028 feet.

NEW MEXICO

A resumption of wildcatting in southeastern New Mexico in the spring is considered almost certain if there are further advances in the price of crude oil within the next few months. During the period of low prices the past summer representatives of the major companies continued to pick up leases and most of favored territory is now held by drilling companies. The areas receiving most attention are eastern Eddy County and northern and northwestern Lea County. While it is not expected there will be any important extension of the Hobbs Pool, its area having been practically defined, it is generally believed there are other pools in that territory that will be discovered when conditions are favorable. The district to the northwest of Hobbs and also to the southeast have not been prospected as diligently as they would have been had crude prices held firm and there is some new territory to the northeast of the Artesia Pool which has been opened for drilling recently. These, with other areas in the southeastern part of the state, are expected to hold the attention of oil men.

Lea County

Gypsy Oil Co.'s No. 1 East Grimes, SW NE SE Section 33-18-38, in the southeastern part of the Hobbs Pool, which gauged 85 bbls. per hour with 9,500,000 feet of gas at a total depth of 4,165 feet, was deepened to 4,190 feet and the 3-inch tubing was lowered to 4,184 feet. The well then gauged 108 bbls. of oil per hour open and 3,500,000 feet of gas. At the former depth the gas pressure apparently held back the oil and the well did not respond as favorably as expected. It was given a potential of 2,657 bbls. per day, but will not be put on production until its offset is completed.

Continental Oil Co.'s No. 4-B State, NE NW SE Section 33-18-38, a diagonal offset to the Gypsy well, is drilling at 3,970 feet in lime and is expected to be an early completion. Same company's No. 5-A State, C NW SE Section 33-18-38, cemented 9⅝-inch at 2,775 feet with 600 sacks and is waiting. It bottomed the salt at 2,535 feet.

Midwest Refining Co.'s No. 26 State, NW SE SE Section 33-18-38, a south offset to the Gypsy well, is drilling at 3,615 feet. It had the first gas at 2,810 feet and a good show of oil at 3,186-92 feet. The top of the brown lime was picked up at 2,810 feet. Midwest's No. 8 Byers, SE NW NW Section 3-19-38, is drilling at 2,492 feet. It topped the anhydrite at 1,550 feet and the salt at 2,535 feet.

Eddy County

Flynn, Welch & Yates' No. 61 State, SE NE NW Section 32-18-28, Artesia area, is drilling at 650 feet in anhydrite, and their No. 62 State, NW cor. SE Section 10-19-28, is rigging up.

Western Drilling Co.'s No. 1 Green, NE cor. NW Section 29-17-29, to the northeast of the Artesia Pool, is drilling at 1,920 feet in anhydrite and brown lime.

De Baca County

Landowners Oil Co.'s No. 1 McAdoo, SW cor. NE Section 16-1s-27, Buffalo Creek, is drilling at 4,630 feet in red sandy shale after cementing a bad cave at 4,626 feet.

Matador Oil Co.'s No. 1 Wood, NE SW SW Section 6-4n-20, Salada Creek, is at a total depth of 3,200 feet and cleaning out to cement cave at the bottom.

San Juan County

Continental Oil Co.'s No. 26, NW SE NE Section 2-29-19, Rattlesnake Dome, was completed in the Dakota at 865 feet and is making 75 bbls. on the pump. Same company's No. 24, SW NW SW Section 1-29-19, the deep test to the Pennsylvanian, is bottomed at 6,066 feet and changing over to standard tools. It was held up at this depth by a cavity which could not be filled so as to re-establish circulation for the rotary although mud. cottonseed hulls and barium were used. Continental's No. 17 State, C NE Section 2-29-19, the discovery well in the Pennsylvanian which is being deepened from 6,790 feet, is drilling at 6,885 feet.

R. C. Oswell's No. 2, NW NW Section 34-30-11w, south of Aztec, which showed for about 25 bbls. of high-gravity crude per day in the base of the Farmington at 1,414 feet, is running casing and will be put on production. Until the Continental's deep well on Rattlesnake came in as a producer in the Pennsylvanian two years ago, it was generally believed the very high gravity crude found in northwestern New Mexico had been distilled by heat and that there was little likelihood of it having migrated from deeper sands. The Rattlesnake discovery, however, confirmed the presence of oil in a deeper formation, the oil being of a more normal grade. There are several structures in San Juan County producing this high-gravity crude from the Dakota which have never been tested in the Pennsylvanian. The Oswell well is farther east and in a younger formation and probably indicative of possibilities in lower horizons, but the depth, particularly to the Pennsylvanian, will be almost prohibitive. However, there are several good prospective horizons below the Farmington sands which are within reach of the drill. The Oswell well is close to the Bloomfield Pool where there are a number of shallow wells producing one-half to 1 bbl. per day each of crude that is close to 90 per cent gasoline.

Hobbs Allowable

Following is the estimated potential and the actual allowable production of the companies producing oil in the Hobbs Field in New Mexico for the last half of November:

Company—	No. of wells	Potential bbls. per day	Allowable bbls. per day
Amerada	11	135,270	4,079
Atlantic	2	7,740	333
Continental	7	64,084	2,239
Empire	6	52,300	1,705
Getty	3	45,525	1,322
Gypsy	9	94,971	2,886
Humble	12	135,614	4,087
Landreth and Texas Unity	3	15,025	522
Mid-Continent	1	2,325	129
Midwest	27	119,993	4,936
Ohio	10	74,738	2,415
Prairie	4	13,219	539
Shell	19	150,399	4,883
Skelly	2	13,700	477
Sun	4	50,625	1,518
California	5	24,331	808
Texas	7	54,133	1,822
Texas Pacific	2	13,600	476
Tidal	8	61,043	1,843
Vacuum	1	2,300	129
Walker	2	668	90
Total	145	1,131,603	37,237

MUSKINGUM COUNTY, SOUTHEAST OHIO, HAS TEN MILLION FOOT GAS WELL

By Staff Correspondent

PITTSBURGH, Pa., Nov. 23.—Southeast Ohio was the scene of the best well completed in the lower eastern fields for many months and equaled in its first test some of the later producers in the upper Tioga gas pool. In the southwest quarter of Section 3, Brush Creek Township, Muskingum County, the Ohio Fuel Gas Co. drilled a test on the Almeda Russell farm in the Clinton sand to a depth of 4,040 feet and it is rated good for 10,000,000 feet a day. There have been other fair wells in this county and township, but none as large.

From the remaining districts of the eastern fields there were reports of 15 completions and 6 dry holes. The completions consisted of 11 gas wells and 4 oil producers with an initial production of only 15 bbls. Work in West Virginia has maintained an even progress in the past few months with no unusual activity except in Calhoun County where considerable drilling has been done. In Southeast Ohio, new work has diminished appreciably. After a rather extended period of idleness in Southwest Pennsylvania, new work has been started recently in several townships of Washington County.

SOUTHEAST OHIO

In sections of Southeast Ohio other than Muskingum County the completions were small, the largest producer being in Washington County. There in the southwest corner of Section 3, Ledlow Township, Homer Neuhart and others completed No. 3 on the Maggie Lisk farm in the Injun sand at a depth of 1,442 feet. It is showing for a 10-bbl. producer natural.

In Monroe County, Swartshouse and Paine drilled a test on the Henry Zwick farm in Section 4, Franklin Township. It was completed at 1,861 feet in the Berea grit, and is producing about a barrel of oil a day with a flow of gas estimated at about 20,000 feet. The oil is from the lime and the gas from the grit. In Bethel township of this county the F. E. McCauley Oil Co. drilled a test on the F. E. McCauley farm in Section 5 to the Squaw sand at 1,575 feet. It is showing for a small gas well estimated at 68,000 feet a day. In Section 11 of the same township, M. Stoffel and others drilled a third well on the M. Stoffel farm in the southwest quarter of the section, which proved to be a dry hole. It went to a depth of 1,360 feet in the Monroe County lime sand.

In Noble County, C. A. Heisler and others completed a test on the W. Heisler farm in the northeast quarter of Section 27, Elk Township. It was drilled in the Germantown sand at 930 feet and will make about a 2-bbl. pumper. In the northeast quarter of Section 6, York Township, Athens County, the Wittmer Oil & Gas Properties drilled a deep test on the Valley Coal Co. tract. It went to a depth of 3,468 feet finding no productive formation. In Hocking County, and the southeast quarter of Section 32, Falls Township, the Griffin Producing Co. drilled a second test on the J. W. Geiger lease of 55 acres. This test had a small showing of oil at the top of the Clinton sand at 3,083 feet, but was abandoned as a dry hole.

WEST VIRGINIA

There was but one oil producer completed in West Virginia and that was a small oil well in Wirt County. On Big Island Run in Clay district, Biddle and Backus completed a test on the Monroe Lewis farm in the second Cow Run sand. It is showing for about a 2-bbl. pumper.

Gas Wells

Calhoun County again presented the most activity with seven gas wells and one dry hole being reported. None of the gassers was very large, yet several were fair wells. In Sheridan district, the Chemical Oil Co. completed No. 5 on

(Continued on Page 71)

MONTANA

A larger number than usual of wells reported abandoned in Montana are given in this week's summary. This does not mean that there has been any particular change in drilling activity but that final disposition is given of a number of isolated wildcats that have been carried as shut down for some time.

Glacier County

L. B. O'Neil's No. 1 McNeil, C NE Section 23-35-5w, in the Cut Bank gas field, was reported a completion this week at around 2,800 feet for 8,000,000 feet of gas per day. This completes the drilling campaign for the year and no additional work is expected to take place before spring. A total of 17 wells, including No. 1 McNeil, have been completed as gassers in this year's campaign and their aggregate open flow capacity, based on gauges made upon completion, is in excess of 279,000,000 feet per day. The wells were drilled by Mr. O'Neil as agent for the Montana Power Co., the reserves being built up for that company's gas line to Butte and Helena and other towns. No. 1 McNeil is located 2 miles east of No. 1 State in Section 21-35-5w, and the same distance south of No. 1 State in Section 11-35-5, the nearest producers.

B. & H. Oil Co.'s No. 1 Yunck, NE SE SW Section 14-34-6w, was abandoned after validating to 50 feet. Same company's No. 1 Haines, C SE SE Section 2-34-6w, which was completed in July for 50 bbls. of oil from sand at 2,761-85

(Continued on Page 74)

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New Field Is Opened at San Miguelito

Continental Company Definitely Proves Area Between Rincon and Ventura Avenue. State Production Temporarily Up

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Nov. 21.—The Continental Oil Co. has definitely proved the existence of a new oil field in the San Miguelito area, approximately midway between the Rincon and Ventura Avenue Fields. The existence of a new field in this area was indicated more than a month ago but water trouble in the discovery well prevented the forming of definite conclusions then.

There is still some doubt as to the productivity of the San Miguelito Field due to the apparent lack of sufficient gas pressure to result in a normal sustained natural flow. Further development, however, may change the aspect, especially since the location of the apex of the structure has not yet been determined.

The Continental's discovery well, No. 1 Grubb, is flowing 1,000 bbls. of 29.2 gravity oil cutting 2 per cent water. The completion depth is 6,750 feet and it is not improbable the production will clean up after the well has been on production for several days. The only disconcerting feature is the absence of sufficient gas pressure to give the well a normal kick and the life characteristic of completions in high pressure zones. This apparent deficiency may be due to an unfavorable position structurally, in which event wells nearer the apex of the structure will show better results. The oil is a sweet crude and highly desirable from a refining standpoint, which places the San Miguelito Field as commercially productive even though artificial stimulation should ultimately be required. The Chanslor-Canfield Midway Oil Co. pioneered development work in this area several years ago but did not succeed in developing commercial production, although this company's No. 2-A Hobson was completed a few months ago pumping 175 bbls. per day from 7,825 feet. Further development work in this area will be watched with considerable interest as the next well should throw considerable light on the extent and productivity of the Grubb zone.

Crude Production

Crude oil production in California, after dropping below the 500,000-bbl. mark for two consecutive weeks, has bounded back above this figure again, at least temporarily. It is interesting to note, however, that the recovery does not cover as wide a range as heretofore. This indicates a cumulative effect in the normal decline taking place and as the drag becomes heavier the effect of new production is minimized. Stringent curtailment at Kettleman Hills and close adherence to curtailment schedules in other fields is also a factor of no little consequence. It is obvious that either one of the two 30,000-bbl. wells completed at Kettleman Hills early this month could upset the present equilibrium if permitted to remain on production.

Coincident with the reduction effected in state production of crude since the first of the year there has been a marked sympathetic decline in both the production of natural gas and the amount of natural gas treated by absorption and compressor plants. The winter demand for natural gas, which started early in November and will reach its peak in December and January, may result in the opening of potential gas wells in the Buttonwillow and Goleta gas fields. In Goleta two gas wells were partially opened during the middle of November and it is not improbable the Milham Exploration Co. will start commercial gas production in the Buttonwillow gas field during December. The Buttonwillow Field, which produces a dry gas, is capable of producing approximately 75,000,000 feet per day and the present supply is being augmented by deepening wells which failed to come up to expectations in either one of the two gas zones known to exist in this field.

Lost Hills-Belridge

The Lost Hills Field of Kern County ceased to be a factor of consequence from an exploration standpoint early this week when the Lincoln Petroleum Co. suspended drilling operations in its deep Temblor test in No. 1-A Theta at 5,329 feet. This well, in Section 12-26-20, drilled partially with dry hole money advanced by operators holding adjacent acreage, failed to come up to expectations and was accordingly suspended. The General Petroleum had previously suspended drilling operations on its No. 1,301 in Section 13-26-20 at 4,399 feet, with the result that there are no deep Temblor tests under way in this field at present. There are still several Temblor tests under way in the North Belridge Field and we may anticipate a few additional completions in this area during the next few months. The Belridge Oil Co.'s deep test in Section 27-27-20 is drilling at 6,790 feet and will probably be carried down unless an adverse geological formation is encountered. This is the deepest well drilled in this immediate area and should prove of considerable importance from an exploration standpoint if drilling operations are continued. In the South Belridge Field the General Petroleum has reached 7,250 feet in No. 1 Berry but has not yet picked up the Temblor as the last core showed the prevailing formation to be a hard brown shale.

Kettleman Hills

Drilling operations in the North Dome of Kettleman Hills have reached the stage where it will probably be several weeks before any additional completions are chalked up. This interval may be broken, however, by completion of the Standard Oil Co.'s No. 65-29 J and recompletion of the Kettleman North Dome Association's No. 58-2 P. The former well, which has encountered a series of fishing jobs during the past 18 months is scheduled for completion in the near future, contingent upon eliminating the water trouble which developed several weeks ago. In No. 8-1 P the Standard recently successfully snubbed in 3-inch tubing to a depth of 7,008 feet and this well is now producing through both the tubing and casing. It produced during the entire snubbing operation and the company is now in a position to bring it under control if this Elliott zone producer is selected as a likely project for completion in the deep Ochsner zone.

The Kettleman North Dome Association has pinched in both of its recent substantial completions at Kettleman Hills and a further curtailment is expected to be made within the next few days. There are five wells entirely shut in at Kettleman Hills in the interests of conservation. These are No. 8-28 J of the Kettleman North Dome Association, No. 2 Felix of the Petroleum Securities and Nos. 21-33 J and 32-3 P of the Standard and No. 3 Huffman of the Superior Oil Co. Two new wells have recently been started in the North Dome and two more are scheduled to get under way within 10 days. The latest spuds in the North Dome are No. 3 Whepley of the Associated and the Association's No. 61-2 P. The Petroleum Securities has reached 9,212 feet in No. 1 Burbank, a deep test in the Middle Dome of Kettleman Hills and, while the outlook is not exceptionally promising, an early test is anticipated. Heavy fittings have already been assembled and a series of gap traps has been moved in. This deep test has been somewhat of an enigma, looking good one day and somewhat dubious the next. The Petroleum Securities has not yet encountered a black oil zone similar to the Ochsner zone in the North Dome and may consequently find it advantageous to test the upper part of the Temblor, which, if it results in commercial production, should be somewhat similar to the Elliott high pressure gas zone in the North Dome.

Elwood

The Barnsdall and Rio Grande successfully completed No. 20 Bell Luton early in the week flowing 538 bbls. of 36.4 gravity oil per day from 3,293 feet, the hole having been finished with a 6⅝-inch liner carrying 50 feet of perforated. In conformity with the agreement reached by operators in the Elwood Field, No. 20 Bell Luton was completed in the Vaqueros sand, although eventually the hole will be deepened to the recently discovered oil sand in the Sespe formation. The Elwood Exploration Co., a subsidiary of the Honolulu Consolidated Oil Co., spudded in No. 7 on tideland permit No. 90 a few days ago, thus giving the Elwood Field two drilling wells at present. The Barnsdall and Rio Grande recently quit-claimed all but 20 acres of the Bishop-Evans lease in this field following abandonment of No. 1 Bishop-Evans, a deep test which failed to result in commercial production. With the limits of production defined in this direction, proven acreage of the Elwood Field still remains at 770, of which 470 acres is inside the tide line and 300 acres in the open ocean and covered by tideland drilling permits.

Ventura Avenue

The Shell Oil Co. has recompleted No. 65 Taylor in the Ventura Avenue Field flowing 1,120 bbls. of 28.6 gravity oil per day from 5,920 feet. The flow was killed and drilling operations resumed so this hole may be carried on down through the Lloyd zone. The Associated killed No. 18 Ventura Land & Water, a recent completion, due to water trouble and corrective measures are already under way. Drilling operations in this field are practically negligible at present, there being only six uncompleted wells under way. The General Petroleum, Shell and Associated recently adjusted a number of producing wells in the Ventura Avenue Field to eliminate the waste of natural gas. For several months during the summer some natural gas was blown to the air at Ventura Avenue but this has been eliminated by adjusting the gas-oil ratio and the Southern California Gas Co. is now utilizing the total field production approximating 135,000,000 feet per day. The General Petroleum has filed abandonment notices covering two wells on tideland drilling permits Nos. 138 and 139. These properties, adjacent to the company's More Ranch where commercial gas production has been developed, are being quitclaimed.

Dominguez

The Union Oil Co. added a new well to its producers in the Dominguez Field of Los Angeles Basin when No. 26 Callender was brought in flowing 240 bbls. of clean 44.3 gravity oil and 18,500,000 feet of gas per day from 5,393 feet. This well, which was finished with a 4¾-inch liner carrying 365 feet of perforated, is believed to be producing from a deeper zone hitherto undeveloped. This is of particular significance because the oil from this new well is approximately 10 degrees lighter than oil produced from any of the upper zones. The Union has two other wells under way in this field but is drilling slowly as it is not the intention to develop additional production at present. Drilling operations in this field are made necessary because of drilling requirements and, while the Shell will be obliged to undertake additional developments from time to time, neither this company nor the Union is engaged in competitive work.

Long Beach and Huntington

The Ring Oil Co. recompleted No. 3 Zenith in the Ling Beach Field of Los Angeles Basin a few days ago and this project was returned to production flowing 310 bbls. of 27.1 gravity oil per day from 8,267 feet. The Superior Oil Co. is abandoning No. 1 Eberle, a deep test in the Huntington Beach Field, and is abandoning the lower portion of the hole in

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Da'ly average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	.....	68,690
Fuel oil	.....	.....	.....	.....	.....	71,950
Diesel and gas oil	.....	.....	.....	.....	1,473,198	3,216,037
Gasoline	407,722	58,246	.....	.....	11,855,404	17,433,472
Kerosene	.....	.....	.....	.....	187,934	.....
Coastwise—						
Crude oil	188,719	26,960	277,410	39,630	18,873,300	14,035,556
Fuel oil	389,069	55,581	368 666	52,667	11,832,310	16,380,322
Diesel and gas oil	.....	.....	24,852	3,265	1,314,957	1,488,689
Gasoline	359,683	51,383	414,812	59,259	12,833,155	11,313,204
Kerosene	8,081	1,154	.....	.....	288,799	151,436
Naphtha distillate	.....	.....	.....	.....	4,952	.....
Exports—						
Crude oil	233.383	33,340	91,750	13,107	6,495,003	6,154,249
Fuel oil	143,149	20,450	82.450	11,779	11,863,576	15,601.721
Diesel and gas oil	6,932	990	94,097	13,442	3,178,775	3,938,634
Gasoline	2,143	306	.....	.....	7,426,700	14.087,172
Kerosene	.....	.....	231,915	33,131	1,627,963	3,145,249
Lubricants	.....	.....	.....	.....	36,353	45,484

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Da'ly average	This year to date	Same time last year
Diesel and gas oil	.....	.....	.....	.....	.....	279,088
Gasoline	71.440	10,206	.....	.....	955,369	1,080 671
Lubricants	3,000	429	.....	.....	38,236	27,796
Coastwise—						
Fuel oil	.....	.....	74,490	10,641	3,105,238	3,033,460
Diesel and gas oil	10,170	1,453	.....	.....	361,089	310,222
Gasoline	46,127	6,590	.....	.....	3,938,689	3,862,946
Kerosene	4,921	703	.....	.....	284,095	206,037
Naphtha distillate	.....	.....	.....	.....	49,780	.....
Exports—						
Crude oil	83,760	11,966	.....	.....	494.511	59,993
Fuel oil	61,795	8,828	80,124	11,446	1,490,526	866.296
Diesel and gas oil	52,952	7,565	.....	.....	535,660	457.589
Gasoline	104,321	14,903	160,817	22,974	4,160 674	3,645,846
Kerosene	.....	.....	.....	.....	802,322	570,271
Lubricants	.....	.....	.....	.....	25,693	33,579

No. 7-2 Gillette, another deep test which failed to find commercial production. This abandonment work should have a tendency to retard any further deep zone exploration in the Huntington Beach Field for the present.

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, well and location—	S-T-R	Depth	Status
Hines Pet., No. 1 Ocean Park, Los Angeles Co.	9- 2-15	7,350	testing
Taylor Oil Co., No. 1 Culver, Los Angeles Co.	12- 2-15	6,238	suspended
Westwood Oil Co., No. 2 Hermosa, Los Angeles Co.	6- 4-14	2,151	suspended
Baxter Pet., No. 1 Hermosa, Los Angeles Co.	5- 4-14	rig	suspended
Staple Oil Co., No. 1 Manhattan, Los Angeles Co.	24- 2-15	2,700	suspended
Pacific Shore Oil Co., No. 1 Lawndale, Los Angeles Co.	20- 3-14	rig	suspended
Lawndale Pioneers, Inc., No. 1 Peck, Los Angeles Co.	20- 3-14	1,908	sd. sh. drilling
Wilmington Consd., No. 1 Watson, Los Angeles Co.	17- 4-13	1,012	cleaning out
Ranger Pet. Co., No. 1 Watson, Los Angeles Co.	28- 4-13	2,713	sd. sh. drilling
Avalon Park Dev. Co., No. 1 Watson, Los Angeles Co.	17- 3-13	....	material
Pedro Pet. Corp., No. 1 San Pedro, Los Angeles Co.	14- 5-13	rig	suspended
Brubaker, W. G., No. 1 Van Nuys, Los Angeles Co.	11- 2-15	2,700	suspended
Rucker & Croul, No. 2 Puente, Los Angeles Co.	27- 2-10	2,200	suspended
El Dorado Oil Co., No. 1 Puente, Los Angeles Co.	30- 2-9	2,250	suspended
Cudahy Oil Co., No. 1 Bell, Los Angeles Co.	30- 2-12	1,370	suspended
Jones, W. L., No. 1 Bell, Los Angeles Co.	31- 2-12	116	sd. drilling
Weist Oil Co., No. 1 Montebello, Los Angeles Co.	34- 1-11	4,902	fishing
Blinn & Gray, No. 1 Montebello, Los Angeles Co.	6- 2-11	5,011	suspended
Yellowstone Oil Co., No. 1 Alhambra, Los Angeles Co.	24- 1-13	3,919	suspended
Yellowstone Oil Co., No. 2 Alhambra, Los Angeles Co.	19- 1-12	2,015	testing
Rucker, L. W., No. 1 Calabasas, Los Angeles Co.	26- 1-17	1,004	hd. sd. drilling
Caballero Estates, No. 1 Calabasas, Los Angeles Co.	23- 1-16	1,460	sd. sh. drilling
Olympic Corp., No. 1 Calabasas, Los Angeles Co.	18- 1-17	5,960	suspended
Simi Oil Co., No. 1 Calabasas, Los Angeles Co.	18- 1-17	3,425	br. sh. drilling
Simi Oil Co., No. 2 Calabasas, Los Angeles Co.	18- 1-17	145	sd. sh. drilling
Marble, Willard, No. 1 Chatsworth, Los Angeles Co.	6- 2-16	1,200	hd. sd. drilling
Superior Oil Co., No. 1 Newport, Orange Co.	27- 6-10	3,820	sd. sh. drilling
Ajax Pet., No. 1 Newport, Orange Co.	21- 6-10	5,950	br. sh. drilling
Vaqueros Major, No. 1 Tideland, Orange Co.	32- 5-11	1,022	suspended
Beck, Alfred, No. 1 Corona, Riverside Co.	8- 4-6	1,110	suspended
Alberta Oil Co., No. 1 Elsinor, Riverside Co.	35- 2-2	3,435	suspended
Duncan, N. L., No. 1 Sagebrush, Riverside Co.	8- 4-6	1,157	suspended
Colan Dev. Co., No. 1 Redlands, San Bernardino Co.	25- 1-2	2,392	fishing
Mason Oil Co., No. 1 Salton Sea, Imperial Co.	1-17-15	620	sd. sh. drilling
Woods, D. E., No. 1 Salton Sea, Imperial Co.	7-11-16	511	sd. sh. drilling
Borderland Oil Co., No. 1 Encinitas, San Diego Co.	12-13-4	2,519	suspended
Borderland Oil Co., No. 1 Point Lomas, San Diego Co.	10-16-3	5,124	suspended
South Bay Oil Co., No. 1 Border, San Diego Co.	31-18-2	1,243	suspended
Itasca Pet. Co., No. 1 Mesa, San Diego Co.	13-18-1	1,625	hd. sd. drilling
Carr, O. K., No. 1 Capistrano, San Diego Co.	12- 6- 8	5,250	suspended
Oklahoma Oil Corp., No. 1 Palms, San Diego Co.	25-11-8	510	cleaning out

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S-T-R	Depth	Status
Western Gulf, No. 1 Santa Maria, Santa Barbara Co.	5- 9-33	8,075	br. sh. drilling
Midwest Oil Co., No. 1 Los Alamos, Santa Barbara Co.	2- 7-35	3,450	suspended
Ohio Oil Co., No. 1 Goleta, Santa Barbara Co.	16- 4-28	6,000	br. sh. drilling
General Pet., No. 1 Goleta, Santa Barbara Co.	21- 4-28	4,533	gas—shut in
General Pet., No. 2 Goleta, Santa Barbara Co.	21- 4-28	4,350	producing gas
General Pet., No. 3 Goleta, Santa Barbara Co.	21- 4-28	6,912	plug 6,625 ft.
General Pet., No. 133 Goleta, Santa Barbara Co.	21- 4-28	2,030	suspended
General Pet., No. 134 Goleta, Santa Barbara Co.	21- 4-28	2,053	suspended
General Pet., No. 136 Goleta, Santa Barbara Co.	21- 4-28	2,047	suspended
General Pet., No. 137 Goleta, Santa Barbara Co.	21- 4-28	2,050	suspended
General Pet., No. 138 Goleta, Santa Barbara Co.	21- 4-28	4,931	abandoning
General Pet., No. 139 Goleta, Santa Barbara Co.	21- 4-28	2,051	abandoning
Bowles Oil Co., No. 140 Goleta, Santa Barbara Co.	21- 4-28	2,065	suspended
U. S. Pet., No. 141 Goleta, Santa Barbara Co.	20- 4-28	2,004	suspended
U. S. Pet., No. 142 Goleta, Santa Barbara Co.	20- 4-28	2,012	suspended
U. S. Pet., No. 143 Goleta, Santa Barbara Co.	20- 4-28	2,010	suspended
El Camino, No. 149 Goleta Tideland, Santa Barbara Co.	22- 4-28	2,010	suspended
Bellview Oil Co., No. 159 Goleta, Santa Barbara Co.	24- 2-28	2,099	suspended
Cochran, J. H., No. 1 Napiea, Santa Barbara Co.	7- 4-29	5,134	to abandon
Strickland & Tippett, No. 1-A Goleta, Santa Barbara Co.	19- 4-27	4,886	cleaning out
Sovereign Oil Co., No. 1 Guadalupe, Santa Barbara Co.	20-10-35	5,500	suspended
Pacific Western, No. 1 Gibraltar, Santa Barbara Co.	14- 5-27	2,345	suspended
Associated, No. 1 Rincon Creek, Ventura Co.	19- 4-24	2,080	suspended
Continental, No. 1 Rincon, Ventura Co.	23- 3-24	6,720	br. sh. drilling
Bell, H. H., No. 1 South Mountain, Ventura Co.	22- 3-21	1,165	fishing
Pure Oil Co., No. 1 S. F. Canyon, Ventura Co.	15- 4-21	2,591	suspended
San Pedro Oil Co., No. 2 Sespe, Ventura Co.	13- 4-21	3,675	sd. sh. drilling
Magu Synd., No. 1 Oxnard, Ventura Co.	17- 1-21	5,225	may abandon
Mex Cal Oil Co., No. 1 Conejo, Ventura Co.	12- 1-20	240	suspended
Graham & Loftus, No. 1 Goose Lake, Kern Co.	20-27-22	4,895	sd. sh. drilling
Wilshire Oil Co., No. 1-A Buttonwillow, Kern Co.	7-29-24	7,000	suspended
Milham Expl. Co., No. 6 Buttonwillow, Kern Co.	8-23-23	4,000	sd. sh. drilling
Purman, T. H., No. 1 McKittrick, Kern Co.	22-29-21	501	suspended
Federal Drlg. Co., No. 1 Buena Vista, Kern Co.	20-31-24	5,380	bailing
General Pet., No. 1 Belridge, Kern Co.	30-28-21	7,240	br. sh. drilling
Wallace, K. C., No. 1 Belridge, Kern Co.	32-29-21	4,222	suspended
Rio Cal Pet., No. 1 Shale, Kern Co.	2-27-18	2,355	suspended
Wicker, Sy., No. 1 Arvin, Kern Co.	12-30-28	3,850	suspended
Shell, No. 1 Weed Patch, Kern Co.	29-30-29	5,910	suspended
Osborn, Colter, No. 1 Weed Patch, Kern Co.	15-30-29	3,465	suspended
Osborn, Colter, No. 2 Weed Patch, Kern Co.	15-30-29	2,005	cleaning out
Fullerton Oil Co., No. 1 Semitropic, Kern Co.	25-27-23	765	redrilling
Standard, No. 1 Devils Den, Kern Co.	14-25-18	1,600	suspended
Cumberland Oil Co., No. 2 Devils Den, Kern Co.	17-26-18	2,950	cleaning out
Signal Oil Co., No. 1 Blackwell Corner, Kern Co.	15-26-19	106	suspended
United Kern Pet., No. 1 Mojave, Kern Co.	26-10-14	1,065	suspended
Meridian Oil Co., No. 1 Mojave, Kern Co.	11- 9-15	3,910	granite
Kendall Dev. Co., No. 1 Mojave, Kern Co.	27-11- 9	880	hd. sd. drilling
Harding, J. B., No. 1 Mojave, Kern Co.	5-10-10	1,030	redrilling
Ritchie, J. J., No. 1 Tejon, Kern Co.	33-11-19	6,025	suspended
Associated, No. 1 Jacalitos, Fresno Co.	22-21-15	6,197	suspended
Kingsburg Expl. Co., No. 1 Kingsburg, Fresno Co.	30-16-23	211	sd. drilling
Panorama Oil Co., No. 1 Carrizo, San Luis Obispo Co.	7-31-21	4,019	suspended
Kent & McDonald, No. 1 Carrizo, San Luis Obispo Co.	3-32-22	2,300	br. sh. drilling
Trav-El Oil Co., No. 1 Carrizo, San Luis Obispo Co.	7-32-22	2,450	cleaning out
Paso Robles Synd., No. 1 Paso Robles, San L. Obispo Co.	34-27-11	4,040	suspended
Cent. Coast Inv. Co., No. 1 Atascadero, S. L. Obispo Co.	5-28-12	1,040	cleaning out
Schilling, C., No. 1 Atascadero, San Luis Obispo Co.	1-29-12	1,650	sd. sh. drilling
Pacific Inland, Well No. 1, Monterey Co.	19-23-15	1,550	gr. sd. drilling
Brown, W. F., No. 1 Parkfield, Monterey Co.	15-23-14	1,051	suspended
Guess, E. B., No. 1 Monocline, Kings Co.	7-21-21	6,197	cleaning out
Lacal Gas Co., No. 1 Dudley Ridge, Kings Co.	32-22-20	rig	rigged up
Irma Investment Co., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,345	gas well—idle
Irma Investment Co., No. 2 Dudley Ridge, Kings Co.	7-23-20	mtl.	building rig
O'Donnell, J. E., No. 1 Dudley Ridge, Kings Co.	7-23-20	1,625	gas well—idle
Eagle Oil Co., No. 1 Dudley Ridge, Kings Co.	15-23-20	411	suspended
Kettleman O. & G. Co., No. 1-A Dudley Ridge, Kings Co.	20-23-20	1,194	cleaning out
Valley Expl. Co., No. 1 Dudley Ridge, Kings Co.	12-23-19	1,440	fishing
Valley Expl. Co., No. 2 Dudley Ridge, Kings Co.	12-23-19	1,141	shut in
Valley Expl. Co., No. 3 Dudley Ridge, Kings Co.	18-23-19	....	material
Knudsen & Schmidt, No. 1 Reef Ridge, Kings Co.	36-23-17	5,315	suspended
Seymour, L. W., No. 1 Avenal, Kings Co.	10-23-16	1,148	suspended
Tulare Basin Gas Co., Well No. 1, Kings Co.	17-23-19	rig	rigging up
Tulaco Oil Co., No. 1 Corcoran, Tulare Co.	20-22-22	rig	suspended
Ducor Pet. Co., No. 1 Ducor, Tulare Co.	14-24-27	2,200	suspended
Inland Valley Oil Co., No. 1 Visalia, Tulare Co.	24-17-24	2,092	suspended
Ellis & Stanford, No. 1 Tulare Lake, Tulare Co.	20-24-23	1,920	suspended
Twin State Oil Co., No. 1 Point Arena, Mendocino Co.	14-12-17	7,694	suspended
Orinda Pet., Well No. 1, Contra Costa Co.	32- 1-3	2,120	suspended
Colusa Oil Co., No. 1 Bush, Colusa Co.	31-15-4	1,000	hd. sd. drilling
Oakdale Oil Co., No. 1 Oakdale, Stanislaus Co.	3- 2-10	4,750	suspended
Orland Oil Synd., No. 1 Orland, Tehama Co.	21-23-3	3,040	suspended
San Joaquin Expl. Co., No. 1 Los Banos, Merced Co.	36-10-9	....	location

HILLSIDE PARED OFF TO ERECT TALLEST DERRICK

What is said to be the tallest steel derrick in the world was recently erected for the Superior Oil Co.'s No. 6 Hartman well at Ventura, Calif., by the Inter-

national Derrick & Equipment Division of the International-Stacey Corp. of California.

Before erecting this derrick it was necessary to cut away a portion of the mountainside to obtain a site. The derrick is a reinforced Ideco "Superior" 178-foot silicon steel with a 32-foot square steel base. It is mounted upon an Ideco steel base substructure instead of the customary wooden underpinning. The steel was erected complete in two days.

This tall steel derrick indicates the trend toward higher and heavier equipment for deep well drilling. The additional height materially speeds up operations on the derrick floor.

JAMES H. CALDWELL DEAD

TROY, N. Y., Nov. 23.—James H. Caldwell, chairman of the board of directors of the Ludlow Valve Manufacturing Co. and formerly president of the company, died in his home here Wednesday, November 18. Mr. Caldwell, who was born in Mobile, Ala., in 1865, graduated from the Rensselaer Polytechnic Institute with the degree of B. S. and entered the service of the Mobile Gas Light & Coal Co., of which he eventually became president. He also became vice president of the Mobile Gas & Electric Co. In 1887 Mr. Caldwell built and placed in operation the electric lighting system in New Orleans just 54 years after his grandfather, James Henry Caldwell, had installed the gas light system there. The next year Mr. Caldwell came to Troy as engineer of the Ludlow company and he advanced steadily in that organization. He had important banking interests, was identified with many philanthropies and was senior warden of St. Paul's Episcopal Church.

W. D. McLARTY DIES

W. D. McLarty, 50, an employe of the Gulf Refining Co. for 24 years and a resident of Fort Worth, Tex., for 19 years, died at his home there recently.

GASOLINE MARKET IN CALIFORNIA IMPROVES

LOS ANGELES, Calif., Nov. 21.—Marketing conditions on the Pacific Coast showed a little improvement during the past week when distributors in the San Francisco Bay region advanced retail quotations on motor fuel to 16½ cents per gallon, tax paid. Previous to this adjustment, gasoline prices in the northern part of the State ranged all the way from 12 cents to 15½ cents. The restoration of normal prices in the San Francisco Bay region was brought about when independent refiners notified jobbers and resellers that no further deliveries of gasoline would be made unless cut rate signs were removed and retail prices stabilized at 16½ cents per gallon. All during the unsettled period, extending over the past several months, the tank wagon price remained at 12½ cents per gallon as at present.

The ultimatum of refiners was productive of satisfactory results and if marketers are able to maintain existing quotations in noncompetitive areas outside of Los Angeles Basin the general situation may be considered quite favorable. The strengthening of retail gasoline prices in certain Pacific Coast areas is of particular interest in view of an increase in export prices posted by the Standard Oil Co. on November 17. Quotations on 50,000-bbl. cargoes of gasoline for intercoastal shipments will be filled by the Standard Oil Co. of California at the ship's rail at either San Pedro or Richmond, Calif., at prices ranging from 5 cents to 5½ cents per gallon. On U. S. Motor, minimum, 65 octane number, the Standard's quotation is 5 cents per gallon; 67 octane number, 5¼ cents per gallon, and on 69 octane number, 5½ cents per gallon. This represents an advance of one-half cent per gallon in each of the three minimum specifications quoted.

O. M. LANCASTER DEAD

O. M. Lancaster, president of the Petroleum Co. and a resident of Los Angeles, Calif., died at his home in that city on Sunday, November 15, aged 73 years. Mr. Lancaster had operated in the California fields several years and before that had been a well-known operator in the Oklahoma and Kansas fields beginning in the early years of this century. He was associated at various times with Charles F. Bisett, P. N. Kerr, W. H. Mosier, George H. Johnson, Harry Steele, J. M. Gillette, J. M. Crosbie and Charles W. Grimes, all veteran producers in the Oklahoma field.

Mr. Lancaster was born in Vevay, Ind., in 1858. He came to Oklahoma in 1889 taking part in one of the runs for homesteads into the new territory. He acquired much land and later engaged in the banking business, but with the spread of the oil producing regions he became mostly interested in oil. While a resident of Pawnee, in Pawnee County, Oklahoma, he was elected county treasurer two terms and declined President McKinley's offer of an appointment as treasurer in the territorial organization. Mrs. Lancaster and one daughter, Mrs. Blanche Maulsberry of Los Angeles, survive.

ON COAL CONFERENCE PROGRAM

At the invitation of Dr. Thomas Stockham Baker, president of Carnegie Institute of Technology, Dr. Gustav Egloff and Alfred Fisher of Universal Oil Products Co. were on the program of the International Conference on Bituminous Coal, held in Pittsburgh recently. Doctor Egloff talked on the economic relationship between coal, oil and gas as fuels, and also discussed cracking of low temperature tars resulting from the Salerni system of low temperature carbonization. Mr. Fisher discussed the several papers on low temperature carbonization of coal which were presented by various authors.

Better Prospects in Central West Area

Nine New Locations in Central Ohio. Detailed Report on Indiana Operations. Seven Completions in Kentucky Fields

By George A. Whitney
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Nov. 23.—All divisions of the Central West Field are holding their own, with prospects of more activity in new development as the price of crude advances slightly. The production in the old Lima Field is now at the dollar mark and well owners and royalty owners feel there are better times ahead. All of the production connected to the lines of the Buckeye Pipe Line Co., in the old Lima Field, is being taken and will be refined by the Solar Refining plant at Lima, which was recently taken over by the Standard Oil Co. of Ohio. The old Lima Field is by no means entirely drilled over as many spots remain that will be tested out within the next year or so.

At McCutchinville, Wyandot County, it was reported that just south of that town about 3 miles where the Sandusky River crosses the highway, will soon be an active spot. Drilling heretofore has been more for gas than for oil and both are being found in the valley along this river. McPheron, Cook and Miller were at 1,200 feet in No. 2 on the Bowman-Billhart farm, Section 21, Tymochtee Township, Wyandot County, approximately 600 feet east of No. 1, in the flats, that showed an initial volume of 1,000,000 feet, and after given a shot showed 744,000 feet. Oil came in and the well was allowed to flow for around an hour putting 8 inches in the bottom of a 100-bbl. tank. This firm has staked three new locations and in the same area Jones & Coyle have started their No. 2 on the Higgins farm, on high ground on the north side of the Sandusky River, near the highway, and same parties during the week made eight new locations and will be busy most of the winter. No. 1 on the Higgins farm of this company was being connected up by the Ohio Fuel Gas Co., and other wells in that vicinity will be connected to the gas line as the new sweating plant has been completed in the immediate vicinity of the wells, considerable sulphur existing in some of the wells. In the same county, in Ridge Township, R. W. Kurtz and others are drilling on the Elmer E. Moser farm, Section 12.

Logan County

In Logan County, the Simms Oil Co. found a light gas volume on the Milton Yoder farm, Lot 10,503, Richland Township, in the Trenton from 1,369-75 feet.

In Hardin County, Cessna Township, the Wiser Oil Co.'s No. 6 Grant Geiger farm, Section 12, produced 5 bbls. of oil initial, with a fair showing of gas in the Trenton Lime from 1,363-72 feet.

The last completion made by the Peninsula Oil Co. on the John P. Caughney farm, Lot 8, Catawba Township, Ottawa County, was reported around 8 bbls.

An oldtimer a few days ago made a remark that while the old fields east of Toledo had a big boom about 37 years ago, the possibilities were still good for small production, especially around the hamlet of Bono, and also in the vicinity of the Wabash company's 640 acres which had only a few wells upon it. These were drilled by Robert G. Stitt and associates and after the death of that oldtime operator nothing further was done and there are still many more spots in many parts of the Lima Field that are still virgin. The old Klondike well just at the eastern edge of the city limits of Toledo, and in the area where all the large refining plants are located, which is more than 37 years old, is said to still pump 2½ bbls. a day. This well came in at 2,200 bbls. initially, but numerous failures were found within a short distance of it. It was on the Miller property and was a crevice well.

CENTRAL OHIO

In the Central Ohio Field there were 9 completions in the field proper, with 2 dry holes and 7 gas wells, none being oil producers. Two completions outside of the field proper and in Meigs County were dry, and there was a light gas well in Perry County. In new work starting there were 3 locations made and 6 wells spudding, a total in new work of 9.

In Ashland County, Farmer and others found a dry hole on the Sarah E. Horn farm, Section 21, Lake Township, in the Berea sand from 711 to 714 feet.

In Lorain County, Dillon & McFredericks have a fair gas well in No. 4 Cora M. Mills farm, Lot 88, Columbia Township, in the lower Clinton lime from 2,670-76 feet. McMillan and others made a location on the H. F. Eggers farm, Section 6, Carlisle Township, and Ramage and Willis made a location on the Frederick Armbruster farm, Lot 89, Grafton Township.

In Athens County, York Township, the Wittmer Oil & Gas Co. ran into a dry hole on the Valley Mining Co.'s land, in Fractional 6, in the Clinton lime at 3,402 feet.

In Tuscarawas County, Washington Township, Hopewell Gas Co. found gas in a second test on the Londias H. Meek farm, Lot 37, in the Lime sand from 3,525-32 feet. Wiser Oil Co. is drilling No. 1 on the Holden Clay Products Co.'s land, Lot 9, Sandusky Township, same county. Status Development Co. is shut down at a depth of 4,350 feet and in No. 1 Edward V. Steele farm, Lot 28, same township. Ohio Falls Drilling & Supply Co. is shut down at 4,770 feet on the Long-Lechty farm, Lot 22, Clay Township, same county.

Stark County

In Stark County, Jackson Township, Ohio Fuel Gas Co. has a nice gas well in No. 1-5,559 J. K. McDowell farm, Section 17. Fred Brendall and others brought in two good gas producers in the same township, one being on the J. H. Carnes farm, Section 16, and the other, No. 1, on the Joseph Warth farm, same section. The Carnes well got its good pay in the Clinton from 4,279 to 4,309 feet, and the Warth farm well got its pay in the Clinton from 4,234 to 4,347 feet. Same parties made a location on the C. and M. Kearkey farm, Section 21, Jackson Township, same county.

In Fairfield County, Perry Sturm and others are drilling on the Jesse H. Hardwick farm, Section 32, Richland Township.

In Guernsey County, W. B. Urban and others have a showing for a light gas well in the Berea sand from 1,075-80 feet in a second test on the Guernsey Valley Fair Co.'s tract in Lots 21 and 22, Jackson Township. W. Keith is drilling No. 3 Bertha M. Smith farm, Lot 36, same township, and R. R. Neddleson and others are drilling No. 7 William Millhouse and others farm, Lot 17, same township.

In Belmont County, Somerset Township, M. W. Fulton and others found an average gas producer in No. 1 Sarah Hughes farm, Section 33, in the Salt sand from 1,033-36 feet. A. C. Peters and others are drilling No. 1 Allen Price farm, Section 20, and Washmuth, Callahan and others are working at No. 2 on the S. P. Butler farm, Sections 32 and 33, same township.

In Gallia County, Cheshire Township, the Gallia Development Co. struck a heavy dose of water in the Macksburg sand from 210 to 244 feet.

Perry County

In Perry County, Madison Township, the Atha Oil & Gas Co. has a fair gas well on the B. Lemaster farm, Section 6, in the Clinton lime, at a total depth of 3,275 feet. Kachelmacker Oil Co. has a rig up for No. 7 on the Hemlock Coal Co.'s land, Section 28, Coal Township, same county, but is not in a hurry to start the well. Marietta Development Co. is spudding on the William E. Kitchen farm, Section 2, Monday Creek Township, same county. Brown & Secrest has a rig on the L. E. Campbell farm, Section 24, Bearfield Township, Mid-East Gas Co. moved in a string of tools on the Homer Claypool farm, Section 11, Reading Township, and Shenker and others are doing the same for No. 1 Elmer L. Vansickle farm, Section 5, same township and county.

The Preston Oil Co., according to advice, will drill deeper its No. 98-1,464 on the Sunday Creek Coal Co. land, Section 12, Ward Township, Hocking County, and the same company has a rig up for No. 1-1,492 on the C. K. McCarty farm, Section 2, Washington Township, same county.

In Meigs County, Salisbury Township, the Ohio Fuel Gas Co.'s No. 2-5,574 on the J. C. Chase farm, Section 34, was dry in the Berea sand at a total depth of 1,560 feet. Joe Rubin and others had a dry hole on the Louisa Smith Bryan farm, Section 36, same township, in the Maxon sand from 968 to 1,020 feet. Simpson & Rice are shut down for repairs on the Thomas Jackson farm, Section 11, Sutton Township, same county.

In Medina County, Barnhart and others' No. 1 J. W. Funk farm, Lot 6, Harrisville Township, is reported with an initial of 40 bbls., at a shallow depth of 434 feet. In Chatham Township, same county, Edison Sons Co.'s Nos. 18, 19 and 20 on the Daniel Ross farm, Lot 7, produced around 4 bbls. each at a depth around 390 feet, and the same company's No. 23 on the George W. Packard No. 1 farm, Lot 4, same township, is also credited with 4 bbls. initial from 421 feet.

INDIANA

Compiled by Paul F. Simpson, state gas supervisor, Department of Conservation, Division of Geology, Indianapolis, Ind.

Daviess County—Ben Ruble is starting a well on the Home Building and Loan Association land, SW Section 27, Harrison Township. His test on the Thomas F. Lambe form in the same section was dry at 747 feet. The Knox Engineering Corp. is deepening an old well in the hope of increasing production in No. 2 Ada Walton, SE Section 35, Barr Township.

Dearborn County—The Dearborn Development Syndicate has shut in its test on the Jacob Steinmetz farm, reporting a small flow of gas. Another test has been started on the Jerry Nowlin farm, Section 34, Miller Township.

Fountain County—A test is to be started soon near Covington.

Gibson County—The Gem Oil Co. abandoned No. 1 George W. Harper, NE Section 8, Barton Township, because it became too light to pump. The Wabash Public Service Corp. is drilling No. 1 George B. Allen NE Section 22, Columbia Township. In SW Section 18, Washington Township, the Big Four Oil & Gas Co. has started another well on the C. T. Sloan farm.

Greene County—A. R. Morris is said to be planning a test north of Lyons. His two wells drilled near Lyons recently have been shut down.

Hamilton County—The E. E. Applegate well in Section 34, Jackson Township, drilled by Lentz and Miller trustee, is down more than 1,200 feet and showings of gas and oil were reported.

Hendricks County—the French Development Co. has started a deep test on the T. A. Reitzel farm, NW Section 8, Liberty Township, and has already drilled 1,000 feet.

Harrison County—The Ivyton Oil & Gas Co. has drilled a well on the J. E. Brown land, SW Section 2, Webster Township; a gas well was reported. No. 1 Dan Cunningham, SW Section 12, Taylor Township, is being drilled by the Wyandotte Oil & Gas Co. In NW Section 7, same township, Joseph H. Kraft, trustee, is drilling No. 1 Bettie L. Foy.

Henry County—Delph & Chew are drilling a well on the Charles E. Jackson farm in Newcastle.

Huntington County—Another well near the three on the Bussard farm south of Huntington is planned by the Two Rivers Oil Corp.

Jefferson County—An Ohio corporation is reported as having recently obtained leases on 15,000 acres.

Knox County—O. A. Thayer is starting No. 1 John Black in NW corner Section 11, Busseron Township. L. J. Lloyd was reported as having completed a 3,000,000-foot well on the Evans farm in the Busseron Township Pool. A well was drilled on the Prather land, SE Section 3, Harrison Township. J. E. Young is drilling No. 1 Floyd Wilson to the McCloskey sand after finding the Brown and Oakland City sands unproductive.

Laporte County—The John Siddles test, drilled by H. J. Hauck and others in Section 4, Lincoln Township, is reported drilling at 680 feet.

Monroe County—A line is being laid from the Unionville Pool to State Road 37, where the gas will be mixed with artificial gas and supplied to Bloomington and Bedford.

Orange County—A rumor has been received to the effect that a wildcat will be started 3 miles north of Orangeville.

Perry County—Conyers & Bugg completed No. 4 Lee Aders in Section 19, Leopold Township, obtaining oil from several different sands. No. 1 Ed Cassidy, drilled by Gustave Walters and others in SE Section 4, Leopold Township, was plugged at 1,436 feet. Moorehead and Blank are down 180 feet in No. 1 James A. Cassidy, Section 16, same township. In NW Section 30, Clark Township, No. 1 Jerome Cassidy, drilled by Fred Conyers, is down 200 feet. The deep test started by H. C. Darby & Co. on the U. B. Cummings farm, Section 8, Tobin Township, is down 250 feet. A good showing of oil was reported at a shallow depth. No. 1 A. V. Doogs was abandoned by J. H. McClurkin, SW Section 9, Oil Township. A test by A. J. Glenn on the Joseph F. Glenn land, Section 12, Tobin Township, was also abandoned. Lane, Beard and others have drilled a test on the Ben Harpman farm in Section 16, Anderson Township. No. 1 John Kauffman, is being drilled by Hughes and others in SE Section 17, Clark Township. Roger E. Williams' No. 1 Louis LaGrange, SW Section 21, Oil Township, was dry and plugged. The well drilled on the Lanman farm, 1 mile south of Bristow, by Lane, Beard and others was dry at 550 feet. Same parties are drilling at 225 feet in No. 1 William

(Continued on Page 70)

Valid patents acclaim TRET-O-LITE as the inventor of the original process for treating crude oil emulsions and B. S. to pipe line requirements.

TRETOLITE COMPANY

MANUFACTURING CHEMISTS

Plants and Laboratories

ST. LOUIS, MO.

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REPRESENTATIVES IN ALL PRINCIPAL FIELDS

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Personal Paragraphs About Oil Men

Ray C. Koster, of C. F. Camp Company, has been spending a few days in Wichita, Kans.

* * *

Walter E. Hooper has resigned as president and director of the Southern States Company, Inc., Shreveport, La.

* * *

D. A. Broden, Kansas City representative of the National Carbon Company, New York, was a recent visitor in Tulsa.

* * *

E. G. Schaffer, St. Louis representative of the Crucible Steel Company of America, called on oil company trade in Tulsa last week.

* * *

Sir Henri W. A. Deterding, K.B.E., general managing director of the Royal Dutch Petroleum Company, is spending a few weeks in Germany.

* * *

Hugh Logie Allan, manager of the Burmah Oil Company's refinery at Rangoon, who has been recently staying in England, is returning to India.

* * *

H. T. Morley, petroleum geologist, has been placed in charge of the Stanolind Oil & Gas Company geological work in Texas, with headquarters at Fort Worth.

* * *

E. J. Wiss, of Borger, Tex., has been appointed district superintendent of the Texas Panhandle district of the Prairie Oil & Gas Company, succeeding A. B. Alspach, deceased.

* * *

Mr. and Mrs. L. M. Kiplinger have returned to Casper, Wyo., after having been in Denver, Colo., and Cheyenne, Wyo., for a short time. Mr. Kiplinger is cashier for the Ohio Oil Company.

* * *

John P. Steele, southwestern district manager of the South Chester Tube Company, has just returned to his headquarters at Fort Worth, Tex., after making a business trip through Kansas and Oklahoma.

* * *

Prof. J. C. McLellan, head of the physics department of the Toronto, Ontario, University, is leaving that institution to make his home in Surrey, England. Doctor McLellan has been very active in helium research.

* * *

Jacob France, president of the Mid-Continent Petroleum Corporation, has been spending the last 10 days visiting the Tulsa office of the company. He left Saturday for New York City and Baltimore where he lives.

* * *

O. K. Burkett, chief supervisor of the East Texas oil field, has opened a proration office at Cisco for the West Texas area, embracing 14 counties. Mr. Burkett will return to East Texas to resume his duties as soon as he has the Cisco office running smoothly. His headquarters are in Henderson.

* * *

With the acceptance of the position of special investigator in the southern California district office of the oil and gas supervisor, S. O. Walker, of Visalia, appointee of Governor Rolph, has assumed his duties under the direction of R. D. Bush, state oil and gas supervisor. He will cooperate with E. Huguenin, head of district No. 1, in Los Angeles.

* * *

John Brown, president of the General Petroleum Corporation of California; C. F. Meyer, president of the Standard Oil Company of New York; E. R. Rich, vice president of the General Petroleum Corporation; F. S. Fales, vice president of the Standard of New York and director of Socony-Vacuum; A. F. Corbin and W. B. Walker, vice presidents of the Standard; L. L. Marcell, chairman of the board, and R. R. Irwin, president of the White Eagle Oil Corporation, a Standard subsidiary, made a visit to the Magnolia Petroleum Company's offices at Dallas, Tex., during the week, and made a trip through the East Texas fields.

Victor Ross, of Toronto, vice president of Imperial Oil, Ltd., has been appointed a director of Teck-Hughes Gold Mines, Ltd., of Toronto.

Men of the Industry

Floyd C. Brown

Floyd C. Brown, vice president and general manager of the Continental Construction Corporation, formed to provide Chicago and vicinity with natural gas from the Panhandle of Texas, graduated from Stanford University in 1911 and received from the same university in 1913 the degree of civil engineer. He was an outstanding athlete in college and was later head football coach at Stanford for four years. During this time he was also instructor in mathematics at the College of Pacific and at Stanford.

Mr. Brown was employed by the Shell Company of California as construction engineer before joining the Empire Companies as assistant superintendent of construction in 1917. He was advanced to superintendent of construction, assistant chief engineer, manager Empire pipe line and chief engineer, and assistant general manager. From 1926 until being assigned to the Chicago gas project he was vice president and assistant general manager of the various oil and gas operating units of the Empire Companies.

When considering the project of supplying gas from the Panhandle of Texas to Chicago, the Cities Service Company, upon being designated to take charge of construction, delegated Mr. Brown to work up the project and construct the line. This was in October, 1929. The main line transmission system of the Chicago project contains 905 miles of 24-inch O.D. pipe, and the gathering system 75 miles of 24-inch pipe, and about 150 miles of smaller sizes. The telephone system contains 1,287 miles of telephone line that required 5,014 miles of telephone wire. This system connects Amarillo and several other points in Texas with Chicago, and provides communication to the 10 compressor stations along the main pipe line.

Associated with the Cities Service Company in the enterprise are the Columbian Carbon Company; Insull, Son & Company; The Texas Company; Southwestern Development Company; Standard Oil Company of New Jersey; Skelly Oil Company and Phillips Petroleum Company.

Mr. Brown is still active in handball, hunting and fishing, and loves outdoor life in general. He is interested in college activities and is a member of the Stanford National Board, which serves in an advisory manner to the board of trustees.

Wallace Ralston, geologist for the Sun Oil Company, has been transferred from San Angelo to Tyler, Tex.

* * *

L. E. Mustard, of the St. Louis, Mo., office of the Bristol Company, Waterbury, N. J., was in Tulsa last week.

* * *

J. A. Kline, sales representative of the Laclede-Christy Products Company, St. Louis, Mo., was a recent caller in Tulsa.

* * *

M. G. Kessling, sales representative, and J. W. Royer, shop superintendent of the Medart Company, St. Louis, Mo., were in Tulsa last week.

* * *

Leo Ranney, president of the Ranney Oil Mining Company, 26 Broadway, New York City, is spending the Thanksgiving holiday in Petrolia, Ontario, Canada.

* * *

J. M. McIntire, vice president and general manager of the New York Oil Company with headquarters in Casper, Wyo., is in New York City on business.

* * *

W. N. Finnegan, Jr., assistant to W. S. Farish, president of the Humble Oil & Refining Company, Houston, Tex., has been confined to his home about 10 days with sickness.

* * *

Allan Cullum, formerly Tulsa district manager for Reading Iron Company, has recently joined the pipe sales force of the Frick Reid Supply Corporation, and will make headquarters at Tulsa.

* * *

A. M. McQueen, of Toronto, vice president of Imperial Oil, Ltd., has been in Calgary to discuss with Alberta government officials the proposed scheme for unitization of Turner Valley operations.

* * *

Fred Hays has been appointed sales manager of the National Transit Pump & Machine Company and will be located at Oil City, Pa. He was formerly with the Prescott Company and Goulds Pumps, Inc.

* * *

John Shaw, of the land department of the Mid-Kansas Oil & Gas Company, Tulsa, and R. J. Metcalf, geologist for the company at Fort Worth, Tex., have been spending a couple of months in Cuba on company business.

* * *

Chester F. Kimball, scout in the Oklahoma City district for the Prairie Oil & Gas Company, and Mrs. Bertha L. Barlow, widow of Bob Barlow who had been a scout for the Carter Oil Company, were married recently in Oklahoma City, Okla.

* * *

Comer Plummer, formerly manager of the southwestern producing division of the Pure Oil Company, has been transferred to Chicago, Ill., to be placed in charge of the eastern producing division. John D. McNutt, assistant to the vice president at Chicago, has been placed in charge of the southwestern division.

* * *

W. E. Haggard, head of the land department of the Continental Oil Company, Ponca City, Okla.; D. D. Christner, district geologist for the company, Fort Worth, Tex., and R. D. and Joe Cannon, geologists of San Angelo, Tex., and B. Goodrich, independent operator of Fort Worth, have been on a deer hunting trip on the Cowden ranch in Frio County, Southwest Texas.

* * *

Operators in the Turner Valley Field, Alberta, recently tendered a banquet to P. D. Moore, former geologist of Imperial Oil, Ltd., on the eve of his departure for Texas. In the course of the proceedings, R. A. Brown, representing the independents, presented to Mr. Moore a gold watch engraved with a diagram of a cross-section of the Turner Valley Field.

Natural Gas Industry Developments

INDUSTRIAL GAS USE TREBLED IN DECADE

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Nov. 23.—The use of fuel oil nearly doubled from 1919 to 1929 and the use of gas increased almost three times in that period, according to a report just issued by the U. S. Census Bureau.

In 1929 American manufacturing industries spent $1,498,228,952 for fuels of all kinds.

Expenditures for fuel oils in 1929 totaled $212,639,372 which was paid for 6,583,198,995 gallons. For gasoline and kerosene $7,556,341 was paid for 48,473,195 gallons.

The cost of natural gas amounted to $69,869,067 for 388,902,064,000 feet and of manufactured gas to $81,078,049 for 512,831,454,000 feet.

American manufacturing industries spent $1,498,228,952 for fuel of all kinds in 1929. As shown above the cost of fuel oils, gasoline and kerosene and natural and manufactured gas was about $371,000,000, leaving about $1,127,000,000 as the expense for other fuels.

For anthracite coal $43,543,316 was expended for 9,281,416 tons; for bituminous coal $754,509,376 for 214,024,754 tons and for coke $243,649,015 for 52,391,839 tons.

The outlay for all other fuels not enumerated here was $85,384,416.

Manufacturing industries also spent in 1929 $475,634,377 for kilowatt hours of electric energy generated outside their own plants principally in public service power plants. A large part of this energy was generated by the consumption of fuel in public service power plants, but neither the quantity nor the cost of this fuel is covered by foregoing figures.

From 1919 to 1929 there was a decrease in use of anthracite from 14,334,402 tons to 9,281,416 tons; increase of bituminous from 203,463,622 tons to 214,024,754 tons; increase of coke from 42,595,019 tons to 52,391,839 tons; increase in fuel oils from 3,766,779,366 to 6,583,198,995 gallons; increase in gas, including, natural and manufactured, from 341,952,022,000 to 913,831,994,000 feet. This comparison of combined natural and manufactured gas is necessary because the 1919 report did not show natural and manufactured gas separately.

In the near future the census bureau will issue a report showing consumption of fuel by industries, by states and by counties.

OBTAIN HYDROGEN FROM GAS

NEW YORK, Nov. 21.—Workers in the laboratory of Prof. N. A. Klukvin of the Leningrad Chemico-Technological Institute have succeeded in extracting hydrogen from natural gases on a semi-commercial scale, according to advices from Russia.

There is an abundance of these gases in Daghestan, along the Volga, on the Black Sea coast, in Central Asia, and Azerbaidshan, the report adds. Formerly these gases remained almost entirely unused, but they will now be converted into artificial gasoline, alcohol and formalin.

CANADIAN GAS PRODUCTION

CHATHAM, Ontario, Nov. 21.—Figures issued by the Dominion Bureau of Statistics at Ottawa show that Canada's output of natural gas for September was 1,557,723,000 feet compared with 1,299,165,000 feet in August and 1,711,029,000 feet in September, 1930. In September, 1931, Alberta wells accounted for 71.9 per cent of the total. Ontario wells 26.5 per cent and New Brunswick wells 1.6 per cent.

PROVIDING FOR PEAK LOADS WITH MINIMUM INVESTMENT OF CAPITAL

By C. S. Goldsmith
Brooklyn Union Gas Co., Brooklyn, N. Y.

Peak loads, whether hourly or daily, occur but a few times each year and consequently we are justified in our hesitancy to invest much capital in schemes to merely handle the peak loads. Most of us have to deal with systems that have grown out of the past when gas was used primarily for lighting purposes. Peak hours are still as troublesome as their ancient brothers of Christmas Eve, but they have shifted about to other days as well as to other times of the day. Distribution systems must now be prepared to meet hourly sendouts three to four times the average and still function economically throughout the year.

If a new transmission main has to be laid to handle peak hours, the lower pressures that will be carried on off-peak hours may effect sufficient economies in pumping costs and decreased unaccounted for to pay a large part of the yearly carrying charges, while additional pumping units to accomplish the same purpose will not make returns the remainder of the year.

Some of the things we should investigate, however, before resorting to costly and irrevocable capital expenditures for new mains are the following:

Transmission System

1. Increasing Initial Pressure:
(a) Use of spare compressor units.
(b) Valving off certain sections.
(c) Operating compressor units in tandem.
2. Increasing Terminal Pressures:
(a) Use of high-pressure holders.
(b) Use of sub-surface high-pressure main.
(c) Use of propane or butane.
3. Conversion of low-pressure mains to transmission mains to supply district regulators.

Distribution System

1. Connecting dead-end mains.
2. Peaking up district regulators.
3. Conversion of low-pressure mains to medium-pressure mains to conduct gas away from district regulators.
4. Conversion of certain low-pressure sections to medium pressure with house governors.
5. Eestablishment of demand rates to reduce peak consumption.

Use of Spare Compressor Units

Spare compressor units are carried primarily for use when certain compressors have to undergo extensive repairs and are taken out of service for extended periods of time. When troublesome peak hours occur only on certain days of the year, such as Thanksgiving and Christmas, or only on cold days during the winter months, compressor units may be overhauled between times and all made available for use during peaks.

Since the number of compressors that may be operated on the same main is limited by the pressure resulting from pumping a certain quantity of gas into the main, it is not usually possible to operate a spare compressor on the same main as the other compressors. If another main is available, however, the spare may be temporarily shifted to this main to pump out gas which would not otherwise be obtainable.

Valving Off Certain Sections

In large companies, where several compressor stations are used simultaneously to pump gas into a connected transmission system, initial pressures may be fairly uniform during off-peak hours, but far from such during heavy loads. Certain sections require more gas than others and as a result certain compressor stations must be operated at higher pressures than others. If these higher pressures are not to be dissipated throughout the net work of transmission mains, some means must be employed to confine them to definite bounds. The temporary closing of valves, either partially or completely, will answer the purpose satisfactorily, but considerable care must be exercised when this is done.

Initial pressures may be increased over peak hours by operating compressors in tandem, if conditions are such that this can be done conveniently.

Use of High-Pressure Holders

When gas has to be stored up at the far end of a transmission main to meet peak requirements, high-pressure holders possess several advantages not possessed by the low-pressure type. Some of these advantages are the following:

1. The high-pressure storage station provides instant relief in case of an emergency, due either to mechanical failure or to the breaking of a main.
2. No large pumping equipment need be provided, since the gas is stored under sufficient pressure to be taken out by its own energy.
3. It is unnecessary to provide steam, either for heating the seal water, as in a wet holder, or for conditioning the tar, as in a waterless holder.
4. The high-pressure storage station may be wholly automatic, thus effecting considerable savings in operating costs.
5. Lower pressures may be safely carried at the end of the transmission main, thus effecting savings in pumping costs and leakage of gas from the mains.
6. The cost of constructing a high-pressure holder is approximately the same per unit quantity of gas stored, regardless of volume or pressure. It is, therefore, possible to develop a storage station in small increments, as needed, with the consequent saving in carrying charges on the investment in a larger low-pressure holder.

NATURAL GAS REVENUE FELL IN SEPTEMBER

NEW YORK, Nov. 21.—Revenues of manufactured and natural gas utilities totaled $44,582,539 in September, a drop of approximately 5 per cent from the $46,852,032 reported for the same month last year, according to data compiled by the American Gas Association from companies serving some 13,636,000 customers and representing about 90 per cent of the public utility distribution of manufactured and natural gas.

Revenues of the natural gas companies were $15,335,172, about 8.4 per cent under the revenues for the same month last year, sales of natural gas during the month aggregating 43,778,580,000 feet.

Revenues of the manufactured gas companies totaled $29,247,367 in September, a decline of 2.9 per cent from the revenues during the corresponding month last year. Sales of manufactured gas during the month were 26,499,654,000 feet.

APPEAL RATE CASES

AUSTIN, Tex., Nov. 23.—Public utilities have filed appeals with the Texas Railroad Commission from ordinances passed by municipalities arbitrarily decreasing gas rates to domestic consumers. The Texas & Louisiana Power Co. appealed from a Ranger ordinance and the Public Service Corp. of Texas appealed a Perryton ordinance. Fourteen appeals in these cases have been made to the commission, Laten Stanberry, director of the gas utilities division, said.

GAS APPLIANCE MEN TO CONFER ON COAST

For the purpose of further acquainting manufacturers of gas appliances and equipment with the recently organized group activities within the manufacturers' section of the American Gas Association, a meeting will be held December 1, at Los Angeles, Calif., to be followed by a similar gathering in San Francisco.

Philip O. Deitsch, manager of group activities of the manufacturers' section, has been designated to attend the coast meetings to outline details of this new work.

Among the activities which have been undertaken is consideration of the inauguration of standards of practice. Another activity in which the groups are interested is the cross licensing of patents, which has in view the elimination of litigation within the gas appliance manufacturing industry. Under the plan contemplated use of patents held by manufacturers would be made by the holder to another for royalties to be stipulated by an evaluation committee, which also would serve, should disputes arise, as an arbitration committee.

SUIT BY LOS ANGELES TO REQUIRE FRANCHISE

LOS ANGELES, Calif., Nov. 21.—Los Angeles city's suit to compel the Los Angeles Gas & Electric Corp. to obtain a franchise from the city to distribute gas is scheduled for hearing in superior court early in December.

The case is up on demurrer and arguments probably will be heard within 10 days or two weeks.

"The city's suit is aimed to restrain the company from distributing gas for power, cooking and heating purposes until the company obtains a franchise from the city," City Attorney Werner asserted. "We claim the company has no franchise from the city for such purposes. The company contends it has such a franchise under old constitutional provisions. We also claim the gas company should pay the city $1,800,000, representing 2 per cent of its gross income in the last five years."

LOUISIANA GAS POTENTIAL

NEW ORLEANS, La., Nov. 23.—Louisiana's 1,090 gas wells in five fields are capable of 9,268,213,000 feet daily production, according to readings compiled by Dr. J. A. Shaw, director of the minerals divisions of the Louisiana State Department of Conservation.

The readings showed 832 wells in the Monroe Field with a capable daily production of 4,552,123,000 feet; 253 wells in the Richland Field with 4,619,068,000 feet; three wells in the East Carroll Parish Field with 18,826,000 feet and one well in Concordia Parish with 28,182,000 feet.

Readings were from 21 wells less than were represented in the April 15 chart and a decrease in daily capacity of 405,538,000 feet.

LONE STAR CASE POSTPONED

The Lone Star Gas Co. rate hearing has been continued until December 8 by the Oklahoma State Corporation Commission.

E. S. Ratliff, commission counsel, said the continuance was made to allow commission auditors to prepare for cross examination of the company's witnesses, on testimony pertaining to operation costs and property valuation, which the commission is investigating in its efforts to adjust rates affecting 28 Oklahoma cities and towns served by the Lone Star.

Forged Welding Fittings saving time, trouble, money

AFTER years of research Crane Co. offers industry several lines of forged welding steel fittings possessing advantages of general shape and design found in cast steel fittings.

Crane seamless steel elbows are stronger than the pipe from which they are made. The usual point of failure of an elbow when subjected to bursting pressure is at the crotch. Due to the manufacturing process used, the thickness of the metal in the elbow is greater at the crotch, giving additional strength against bursting pressures and shock.

With a tangent or straight run of pipe at each end, these elbows give greater strength against bending when welded in the line because the greater bending stresses which occur at the point of curvature are not directly at the weld.

Also, the inbuilt or integral tangents found in these elbows make possible quicker and more convenient fabrication. There is always ample room to work around the Crane elbows, regardless of the type of connection used.

The advantageous radii to which Crane seamless elbows are formed; namely, one outside diameter, allows them to occupy a minimum space, and makes it possible to locate them in positions that would not be practicable with fittings of longer radii. The generous tangents provided bring the joints far enough away from the bend to give every access for the various types of joints. Write us for circular No. 236, describing these new materials in full.

Crane Welding Tees No. 353-E 2½" and smaller, both standard and extra heavy, are forged solid and bored to required thickness. When 3" and larger they are made in the standard weight, forged in halves and electric fusion welded.

Crane Welding Elbow. Tangent on each end of each fitting lines up pipe before welding. No. 352-E Standard Pipe Thickness. No. 452-E Extra Heavy Pipe Thickness.

Crane Welding 45° Elbow. No. 354-E Standard Pipe Thickness. No. 454-E Extra Heavy Pipe Thickness.

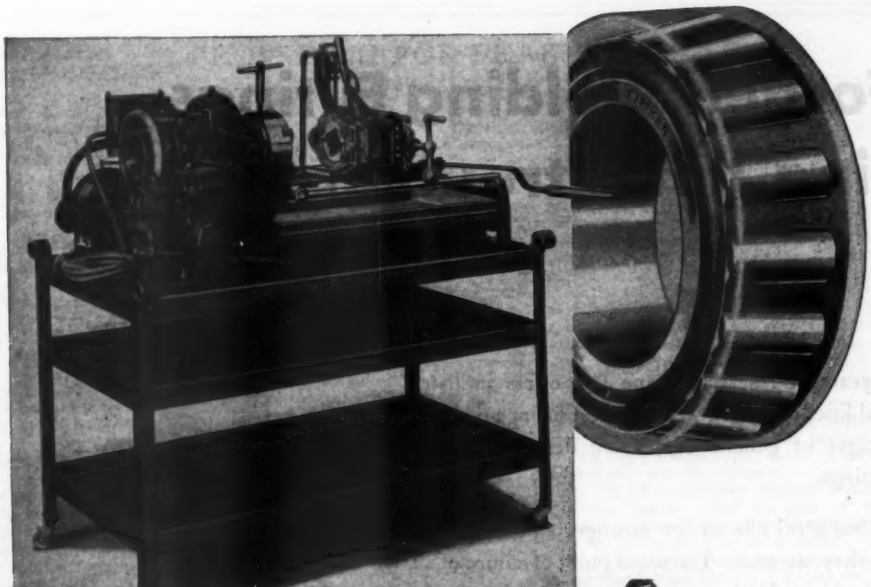
Valves CRANE *Fittings*

PIPING MATERIALS TO CONVEY AND CONTROL STEAM, LIQUIDS, OILS, GAS, CHEMICALS

GENERAL OFFICES: 836 S. MICHIGAN AVE., CHICAGO

NEW YORK: 23 W. 44TH STREET

Branches and Sales Offices in One Hundred and Ninety Cities



The NYE Lightweight Champion portable pipe threading machine manufactured by The Nye Tool and Machine Works, Chicago, is equipped with Timken Bearings on the worm gear shaft. By keeping this vital shaft in alignment and protecting it against radial, thrust and combined loads, Timken Bearings help to assure permanent accuracy of operation, long machine life, minimum maintenance cost and worth-while saving of power. Specify Timken-equipped.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

Oil Industry Equipment and Supplies

OIL SUPPLY VISIBLE IN LUNKENHEIMER OIL CUP

A new type of wick oil cup, marketed by the Lunkenheimer Co., Cincinnati, Ohio, is called the "Glaswick." It pro-

vides automatic lubrication, visibility of oil supply, maintenance of constant oil level with consequent uniform feed, and ease in replenishing the oil supply. The "Glaswick," which has a capacity of approximately 4 ounces of oil, consists of a steel cup with a shut-off cock in the shank, and a glass bottle which fits over the top of the cup. The bottle is held securely to the cup by means of a steel wire and clamp. Tight closure between glass bottle and steel cup excludes dirt.

When placed in service the steel cup is filled with oil. The glass bottle is also filled and placed in an inverted position over the steel cup. Visible presence of oil in the glass bottle is assurance that the steel cup is full and the wick is absorbing sufficient oil to insure a constant uniform feed to the bearing. The desired rate of feed is obtained by determining the number of strands of wick to be used, and the oil then feeds at a uniform rate. The cup needs no further adjustment. When replenishing the oil supply, several spare bottles can be filled in the oil room, carried in a basket or box to the bearings and the empties replaced with full bottles.

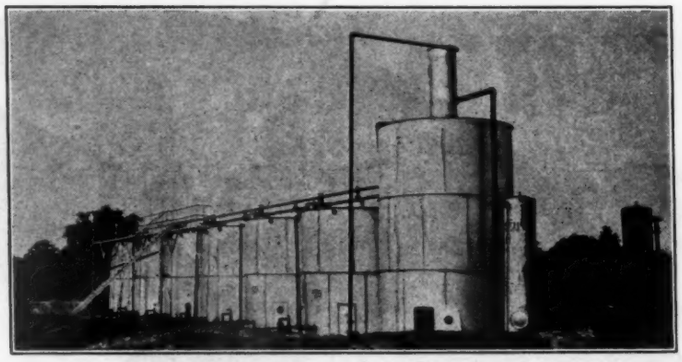
The cock in the shank permits shutting off the flow when the bearings are idle, making it unnecessary to remove the wicks to stop the feed. This shut-off feature also conserves the oil supply when machinery is not running. Further, it provides an accumulation of oil to flush the bearing when the cock is opened. After the accumulated oil runs out, the "Glaswick" feeds at the predetermined rate. Booklet F-532, containing complete information and list prices, is sent by the company upon request.

ANNOUNCES 4-TON 6-WHEELER

The Federal Motor Truck Co., Detroit, Mich., announces a 4-ton 6-wheeler as an addition to its line. The new model carries a nominal rating of 4 tons and a total gross rating of 18,500 pounds. It is powered by a 6-cylinder 7-bearing engine and is produced in two wheelbases, 164-inch and 182-inch. As on the 3-ton 6-wheel truck, 6-wheel hydraulic brakes are provided. These large hydraulic brakes, 16 inches in diameter and 2½ inches wide—one on each wheel—are power-operated by vacuum booster, providing positive braking with slight effort on the part of the driver.

Appointment of John H. Thompson as Federal branch manager in Detroit has been announced by Henry Krohn, vice president in charge of sales of the Federal Motor Truck Co., Detroit, Mich.

FLUME TANK INSTALLATIONS COMMON IN EAST TEXAS



Tall flume tanks and flume separators are coming into general use in the East Texas oil fields to take care of the great quantities of casinghead gas which has caused disastrous explosions and fires since that field was opened. The flume tank is placed at the head of a battery of lower tanks to which it is connected. In the flume tank is a cylinder 30 or more inches in diameter extending from near the bottom of the tank 9 feet above deck. Baffle plates are built into this cylinder above the deck and as the oil from the trap separators is pumped into the cylinder through an inlet just above the baffle plates it splashes down over the plates. The remaining casinghead gas is released and goes to the top of the separator where it is drawn away under vacuum pressure.

At present most of this trapped gas is being piped away to a safe distance and allowed to escape through pipes extended high into the air. However, producers are beginning to build small refineries in the field for the purpose of converting to use this great quantity of casinghead gas now being wasted.

Driving through the district one sees hundreds of these flume tank installations. In many cases the flume tank was being added after the remainder of the battery was in use. The Columbian Steel Tank Co. reports placing more than 60 flume installations in the London Field near Overton this season. Similar installations from the same company are seen in other sections.

The Columbian flume tank and separator installation shown here is in the London district near Overton.

NOTES ABOUT TRADE LITERATURE

The Fisher Governor Co., Marshalltown, Iowa, has prepared a bulletin describing in detail its new series 4000 pressure controller, designed to give accurate and positive control of reduced pressures, relief pressures or vacua.

Recording instruments, CD type, for alternating and direct current are the subject of an illustrated 20-page bulletin issued by the General Electric Co., Schenectady, N. Y.

Bulletin No. 2050-B, being mailed by the Neilan Co., Ltd., Los Angeles, Calif., tells about the new Neilan pressure controller.

The Baroid Sales Co., Los Angeles, Calif., is distributing a 4-page bulletin emphasizing the advantages of the Lemco mud screen.

In the new Wright No. 15 condensed catalog, each type of Wright hoisting and conveying equipment is described briefly. Among the types of equipment included are: Hand-operated chain hoists, trolleys, trolley hoists, traveling cranes, jib cranes and electric hoists. Copies can be obtained from the Wright Manufacturing Co., Bridgeport, Conn.

The new Wilson-Snyder duplex piston pump for high-pressure boiler feeding and gathering service is the subject of a bulletin issued by Wilson-Snyder, Pittsburgh, Pa.

The American Steel Derrick Co., Tulsa, has prepared a four-page illustrated bulletin describing American steel derricks, one of which was used in drilling the world's deepest cable tool hole, in Irion County, Texas.

Keckley floodlights are the subject of a four-page bulletin issued by the O. C. Keckley Co., 565 Washington Boulevard, Chicago.

An entirely new and more complete reference book on valves has been issued by Homestead Valve Manufacturing Co. A copy may be had upon request to the company in Coraopolis, Pa., or to one of its representatives in all principal cities.

A new catalog published by the Enterprise Oil Burner Co., 2902 Nineteenth Street, San Francisco, featuring improved types of oil burners, contains 32 pages, presenting complete illustrations and details of the burners, with specifications and data on fuel consumption and heating statistics.

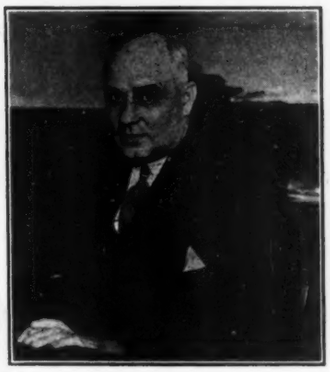
A booklet issued by the Ayer & Lord Tie Co., Chicago, points out the destruction wrought by termites (white ants) in wood fence posts, floorings, foundations and timbers in other uses, and offers creosote oil treatment as a preventive.

The ninth edition of the "Belt Users' Book" has been printed by J. E. Rhoads & Sons, Philadelphia, Pa. Besides the information contained in previous editions it offers helpful discussion of short centers and group and individual drives. The volume is sent free on request.

Tables presenting valuable data on driver and driven shaft speeds are printed in Bulletin 3301, published by the Gates Rubber Co., Denver, Colo.

MEN KNOWN *in* THE EQUIPMENT FIELD

W. C. Heath, formerly vice president in charge of engineering and manufacturing of the Fairbanks-Morse Co., has been



W. C. Heath

elected vice president in charge of research engineering and factory production of the A. O. Smith Corp., Milwaukee, Wis. His job will be to correlate the many activities of the Smith corporation.

Mr. Heath was born in Capron, a cross roads town in the rich corn belt of northern Illinois. Engineering and mechanics attracted him. He attended the University of Wisconsin in 1907, and then Lewis Institute, Chicago. Fresh from the technical school classroom, he became a draftsman in the engineering department of Fairbanks-Morse. The title of vice president in charge of all manufacturing came to him in 1927.

NORTHERN INTRODUCES NEW NITRALLOY PUMPS

The Northern Pump Co., Minneapolis, Minn., has announced another new series of precision rotary pumps in its nitralloy line. The series, designated as the XD, is the series next larger than the first group of XA pumps built of nitralloy steel.

The capacity range of the XD series is from 1 G.P.M. to 15 G.P.M. Two types of bearing construction are available. Nitralloy bearings for supporting the pump shafts are used in pumps to handle fuel oil, gas oil, or any other liquid with little or no lubricating value. Roller bearings are incorporated in the XD pumps to be used for handling clean lubricating oil, especially for high pressure conditions, such as 1,000 pounds.

Nitralloy steel is the hardest metal known and because of the resistance of the material to abrasion, pumps made of this steel will last indefinitely.

HERCULES MOTORS PUTS NEW ENGINE ON MARKET

The Hercules Motors Corp. of Canton, Ohio, is now manufacturing a line of small, modern four-cylinder engines and power units designated as the Hercules IX series. Model IXA is offered in 3"x4" size with 113.1 cubic inch displacement, and model IXB in 3¼"x4" size with 132.7 cubic inch displacement.

The IX series engines and power units are simple in design and construction. They are designed and built for heavy-duty purposes and are arranged to accommodate all modern accessories.

In addition to their heavy-duty character, these small engines have been developed also for efficient high-speed operation for automotive and marine purposes.

ANNO

The new Series 1R Tube-Turns, added to the three already-established Tube-Turns Series (1½R, 1½RX and O. D.) now make available to you a complete line of fittings for welding, complete in sizes and weights that meet virtually every need for modern piping.

UNCING . . .

the NEW TUBE-TURNS

TODAY the new Series 1R Tube-Turns take their place in the Tube-Turn line—a new series of the *original* fittings for pipe welding. Today you can buy genuine, *seamless* Tube-Turns *at greatly reduced prices*—and still get ALL the exclusive advantages found *only* in genuine Tube-Turns.

***FIRST*—You *still* get ideally strong, *seamless* fittings made by the exclusive Tube-Turn process, from *seamless* tubing.**

♦

***SECOND*—You *still* get uniform wall thickness—no thinning or stretching of outside walls—no thickening or compression of inside walls—full pipe size throughout the turn.**

♦

***THIRD*—You *still* get fittings that exactly match the pipe in outside diameter, inside diameter, wall thickness and wall tolerance—fittings that line up at all points.**

♦

***FOURTH*—You *still* get fittings that are made on a *constant* radius—easy to design, easy to calculate for pressure-loss.**

♦

***FIFTH*—You *still* get fittings which are free from the corrosion-inviting structure set up by bending and similar processes.**

♦

***SIXTH*—You *still* get fittings that can be cut to form elbows of any desired angle.**

♦

***SEVENTH*—You *still* get fittings which are neither bends, stampings nor castings.**

♦

***EIGHTH*—You *still* get the fittings that are proved by years of use and which are accepted as the *standard* of comparison.**

♦

Today this new addition to Tube-Turns' line is now in the stocks of distributors. . . Write *today* for full descriptions and specifications—and *prices*. The coupon is for your convenience.

♦

***Address:* Tube-Turns, *Incorporated*, 1311 Shelby Street, Louisville, Kentucky.**

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Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

GETTING OIL TO THE REFINER

There is a good deal that I do not understand about the proceeding followed in getting the oil from the well to the refiner or other customer. I wonder if you would tell me just how the owner of a well goes about it to dispose of his oil as it is produced.—T. L. D.

When an oil well is completed and put on production the owner either calls upon a pipe line company or is called upon by a representative of a pipe line company with regard to the purchase of oil and making connections to the lease tanks. If a satisfactory agreement is arrived at a crude oil purchasing company will authorize the pipe line company to make connection to the property and run the oil for the purchaser's account with the pipe line company and deliver the oil at a designated point into storage facilities owned by the purchasing company, under a definite tender arrangement with the pipe line, or to storage tanks of some customer, with whom the purchasing company has made arrangements to sell and deliver the oil.

The pipe line company will keep records to show the quantity of oil it receives, transports and delivers. The purchaser makes payment for the oil to the producer and royalty owners as it is received and accounted for by the purchaser and pays the pipe line company for gathering the oil and transporting it to the terminals where it is delivered. When the oil is sold the pipe line company collects from the ultimate buyer of the crude, usually a refinery. For this service the purchasing-selling company charges a brokerage fee of about 10 cents a barrel.

The barrel of oil that may be produced from a well in Texas or Oklahoma may ultimately be delivered to a refinery in New Jersey, Kansas or Pennsylvania, and therefore the transaction will have to pass through several different pipe line companies before the oil reaches its destination. This will necessitate its being received, measured and transported under federal and state regulations, accounting for the oil in transport, its delivery and payment for it, all of which involves much clerical work before the actual purchase is consummated.

When a pipe line company, which is the transportation company only, and not the purchaser in many instances, decides to make a pipe line connection for a well or lease it first ascertains whether the amount of oil to be obtained justifies the investment in gathering lines and connections. If the pipe line connection is authorized, the next thing to do is to "strap" the tanks and transmit the measurements to the general office, where the tank capacity is computed and the tank is given a number. The calibration of the tank measurements is converted into what is known as a "tank table" and this shows the contents of the tank for each quarter-inch of height.

The tank having been strapped and the connection made, the producer then can proceed to fill it with oil. The gauger for the pipe line company will go to the lease when the tank is filled, measure the height of the oil in the tank, test the oil, and if it is satisfactory as to quality he will open the valve at the base of the tank and turn the oil into the pipe line system.

The oil may flow out of the tank by gravity or it may be necessary to pump it out, but in either case it is delivered through the gathering system into larger lines and finally into the main line trunk system. If the oil must be pumped out of the tank the pipe line company usually is allowed 1 cent per barrel for this expense.

When gauging a tank of oil it is usual practice for a representative, usually the leaseman, to witness the gauge taken by the pipe line gauger. He will check the gauger's report upon oil level when the tank was turned on the line, and the measurement when shut off, and in addition make notations as to gravity, temperature, reading and sediment conditions of the oil. The operator keeps one of the three tickets made out. The gauger forwards one to the general office of the pipe line company and keeps one copy for his own records.

These gauge tickets are recorded in the office of the pipe line company and then turned over to the purchaser of the oil and the purchaser computes from this information the number of barrels of oil run from the property and the value of the oil at its posted price per barrel and makes the necessary records. At regular intervals, about once a month in most cases, a check is issued to the operator for his portion of the oil and to the royalty owners for their part of the oil that has been run from the well or lease.

DEEPER CABLE TOOL WELL

The reply to a question from G. W. L. on this page in the issue of November 12 indicated that the deepest well in this country drilled entirely with cable tools was the Big Lake Oil Co.'s No. 3-C University in the Big Lake Pool, Reagan County, Texas. The Big Lake's No. 3-C University is the deepest cable tool producing well of which this department has a record, but in the adjoining county in Texas, Irion County, is a cable tool hole 360 feet deeper, shut down at 8,900 feet after encountering salt water at 8,885 feet. This is P. H. Williams' No. 1 Ash, in Section 20, Washington County School lands. Mr. Williams had hoped to pick up the deep pay horizon found in the Big Lake Pool, but if that formation was penetrated it was unproductive.

GISH-ROONEY METHOD

Would appreciate it if you would let us have a detailed explanation of the Gish-Rooney resistivity method of finding underground water.—E.L.L.

"Applied Geophysics," published by the Science Museum, South Kensington, London, S.W. 7, England, gives the following brief description of the "Circuit for Gish & Rooney Method":

"The diagram prepared for the museum shows a circuit slightly modified from that used by Gish & Rooney which is often used in resistivity surveys. The circuit consists of a battery to supply the current, an ammeter, and a potentiometer. The leads are connected to the four earth electrodes through a double commutator-mounted on the same shaft, so that as the commutator rotates, the leads to the electrodes are reversed.

"In most cases the battery is an ordinary 60-volt high-tension dry battery, and the ammeter has several ranges and can measure currents of the order of milliamps. up to about 0.75 amp. A convenient range of the potentiometer is from 1 to 1,100 millivolts. The double commutator is used to eliminate the effects of natural earth currents and polarization potentials at the electrodes."

The book contains a chapter devoted to "Electrical Methods" and in it there is a discussion of the Gish & Rooney system, together with several other systems of like nature. You can get a copy of the book by addressing the Director of The Science Museum at foregoing address. The cost is 2 shillings net.

WHY WAS IT CALLED THAT?

CHATTER MARKS

"Chatter marks" is the name the geologist has given to small dents that are found in rows of two or more, sometimes accompanying and running parallel to glacial scratches and grooves. They are produced by glacial abrasion. The word "chatter" is of imitative origin, indicating in its commonest use sounds produced by rapidly succeeding contacts, as of the teeth of a person shivering from fright or cold. By extension the word also means to vibrate rapidly in the act of cutting, because of unevenness. It was this latter use of the word that led to its adoption by geologists in the term "chatter marks."

KONAWA POOL COSTS

Will you please give me the approximate production of operating costs on say a 40-acre lease, four wells, in depths ranging from about 2,800 to 4,500 feet in the vicinity of the Konawa Pool in Seminole County, Oklahoma?—R. E. C.

Conditions vary so in the Konawa Pool that it would be difficult to give you any reliable cost data on a lease such as you describe. Operators in the Konawa Pool say it is possible to find every class of production there ranging from flowing wells to power pumping, and under such a wide variation the costs will vary materially. General cost figures might be misleading.

You can get valuable information about all phases of drilling and producing in the Seminole Pool by writing the U. S. Bureau of Mines, Bartlesville, Okla., for a copy of its reports on the Seminole Pool. There are two of these reports, a preliminary one and then a final report.

WHY SAND POROSITIES DIFFER

In your answer to a question sent in by C. M. N. you gave some interesting facts about the wide differences in sand porosities. May I ask you to tell a little more in detail what brings about these differences? You mention the degree of uniformity in the grains that make up an oil sand as being the chief factor, but add that other conditions play a part. I would like to know more about these conditions. Is there any difference between the porosity of an oil sand and that of a gas sand?—N. A. O.

The porosity of a gas sand is likely to be greater than that of a sand producing oil, but there is nothing that can be set down as a fixed rule in this matter. Drillers speak of sands as close or open, hard or soft, good or poor, etc. In reply to your request for more detailed information as to what makes the differences in porosity the following is quoted from Wentworth H. Osgood's "Increasing the Recovery of Petroleum":

"The porosity of a sand does not depend upon size of grain; a fine sand may have pore space less than, equal to, or greater than a coarse one. Uniformity of grains, shape of grains and arrangement or system of packing affect porosity. The amount of petroleum and natural gas that a reservoir will hold depends upon its size and its porosity. The porosity of a fractured rock varies greatly because of differences in size and irregular spacing of fractures. Porous sands, on the other hand, are comparatively regular, although many of them show considerable differences also.

"In nature, however, sand grains are not spherical in shape but occur in an infinite variety of forms and in all gradations of size from the finest dust particles to coarse pebbles. Obviously, when angular fragments of such character are deposited under water in the process of sedimentation, tabular faces of fragments will assume similar orientation and be brought into close juxtaposition; small grains will be deposited in the interstices between larger grains, thus resulting in materially lower porosities than Slichter's figures for spherical grains would indicate.

"Cementation by silica, calcium carbonate, iron oxide, or other substance will decrease porosity. An experienced driller can generally estimate the porosity of a sand by its feel. If it is loose and free from cement and clay particles, its porosity is likely to be high. Clay particles between sand grains greatly reduce porosity. The small clay particles fill the pores and some clay is in a jelly-like colloidal state which is relatively impervious. Later deposition of secondary cementing material within the sand pores will thus still further reduce the free pore space available for the storage of oil. Conditions in nature, therefore, are such that porosities of less than 30 per cent are probable in sandstones not greatly influenced by induced porosity of secondary character. It should be noted, however, that any deformation of sediments after they have become thoroughly consolidated will tend to increase the porosity, due to the formation of secondary fractures and cavities. It seems probable that the porosities of many oil-reservoir rocks have been influenced by secondary readjustments of this nature.

"The percentage of voids in the various kinds of strata varies considerably. Sands may contain from 15 to 35 per cent voids; sandstones, 5 to 15 per cent voids; conglomerates may contain as high as 30 per cent voids; shales, from 2 to 10 per cent and some dolomitic limestones are reported to contain as high as 35 per cent voids."

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas, and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

HYDROGEN SULPHIDE DECOMPOSITION TEMPERATURE

Is hydrogen sulphide most active as a corrosive agent at low temperatures or at high temperatures? As you know, our crude contains high sulphur, some of which is hydrogen sulphide, but the corrosion of cracking tubes, vapor lines, etc., seems to be greater than in the topping units. The corrosion shows up as pitting.—T. M. N.

Hydrogen sulphide is corrosive at normal temperatures but the damage is usually not so serious at the low temperatures as under temperatures above the decomposition point. The reason that deep and serious corrosion is not so liable to be found under low temperature conditions is that the film of sulphide covers the metal to protect it from further action. When oxygen, air, is present a different condition exists; here the oxygen combines with hydrogen sulphide to form sulphuric acid. This condition is frequently responsible for serious damage to tanks, condenser coils and any parts that are in the path of the gas at comparatively low temperatures. While pitting is often caused from hydrogen sulphide where heat is not a contributing factor, as in well casing and tubing, the most serious examples of pitting are liable to result at high temperatures because of the decomposition of hydrogen sulphide.

Hydrogen sulphide tends to break up into hydrogen and sulphur, the sulphur uniting with the iron to form iron sulphide and any excess sulphur will under favorable conditions be deposited on the metal. These localize corrosion so that pitting proceeds much faster than one would expect. Very often pellets of sulphur will collect on the inside of vessels, pipe, etc., and the final pit will correspond with the shape of these deposits. Sulphur has a great affinity for iron and once the combination is started it proceeds rapidly.

It appears that in this case there is hydrogen sulphide formed during the distillation of the oil, then this is decomposed at the higher temperatures to cause the damage. As previously suggested, hydrogen sulphide separates to form hydrogen and sulphur at the higher temperatures more rapidly, the rate of decomposition being quite slow below 600° F., but at 932° it is rapid. It is generally true that hydrogen sulphide burns to sulphur dioxide; however, this step probably does not take place upon direct heating.

Several of the corrosive agents met with in petroleum refining were studied by Retailliau and Lang, as reported in The Oil and Gas Journal, December 5, 1929. Part of their discussion on hydrogen sulphide is abstracted.

Strips of wrought iron and steel were used for testing the corrosive action. The gas was heated to 864° F. in a tube, and then left standing in contact with the strips over night. Chemical tests showed almost no hydrogen sulphide left in the tube but upon washing out the gas a fine colloidal suspension was observed in the wash bottle containing water. This was identified to be free sulphur, evidencing the dissociation of hydrogen sulphide at the temperature of the experiment and confirmed by the yellow deposit seen on the cold parts of the tube. The colloidal material was treated with carbon disulphide, which upon evaporation deposited the characteristic rhombic crystals of sulphur. "The amount of free sulphur thus liberated was quite large, and led us to believe that the action of hydrogen sulphide on iron might result from dissociation into hydrogen and sulphur, especially if we remember the ease with which sulphur and iron react."

APPROXIMATE POURPOINT

Do you believe that a cold test run in a regular 4-ounce sample bottle will give a fairly accurate result as compared with an apparatus that is entirely standard? About the only difference is the location of the thermometer bulb; in the bottle it is an inch or more off bottom while in the standard jar it is resting on the bottom.—N. S. R.

Cold test is no longer recognized in standard specifications, being replaced by the pourpoint. The A.S.T.M., Method D97-27T, also Bureau of Mines Tech. Paper 323B, gives these definitions:

1. (a) The cloud point of a petroleum oil is that temperature at which paraffin wax or other solid substances begin to crystallize out or separate from solution when the oil is chilled under certain definite specified conditions.

(b) The pourpoint of a petroleum oil is the lowest temperature at which this oil will pour or flow when it is chilled without disturbance under certain definite specified conditions.

2. (a) The test for cloud point shall be used only for oils which are transparent in layers 1.5 inches thick.

(b) The test for pourpoint shall be used for all other petroleum oils and may be used for oils on which the test for cloud point is permitted.

It should be noted that the pourpoint is a temperature obtained under certain definite specified conditions. The A.S.T.M. methods are intended to be accurate means for ascertaining the facts, such as should be known when other determinations are questioned, and cannot be classed with approximations. Routine tests for control work need not always be made with the extreme care necessary for referee work and frequently modifications, possibly short cuts, are made in the standard methods to suit local conditions. These may be time savers or they make use of less expensive apparatus. However, I see no reason why the standard apparatus and methods should be changed in this way because of time or expense. A few degrees difference in the result may be the source of troublesome complications which could have been avoided if the simple method and inexpensive unit had been used.

SPENT ACID LIGHT OIL TREATING

Could you please advise me of the method or methods used in determining when sulphuric acid, used in the treatment of straightrun gasoline, is spent? Does the specific gravity or Baume gravity give any indication for rapid determination?—A. F. R.

Very little sulphuric acid is now used for the treatment of gasoline, its use being confined largely to the purification of pressure distillates, kerosene and the lubricating fractions. There are some crude oils which contain large quantities of sulphur and others in which the sulphur is present in an unusual form. The lighter distillates from these have to be treated with sulphuric acid.

The quantity of acid required for treating the gasoline and kerosene varies to a considerable extent and consequently there is a great difference in the strength of the used acid. Some refiners state that the spent acid shows a density of 40° Be. and the other extreme is 55°.

The concentration of sulphuric acid solution of the indicated range is shown in the table.

SULPHURIC ACID SOLUTIONS

Be.—	Sp. gr.	H_2SO_4 (%)
35	1.3182	41.27
40	1.3810	48.10
45	1.4500	55.07
50	1.5263	62.18
55	1.6111	69.65

It should be noted that sulphuric tables of this character are arranged on the basis of water solution of the pure acid, consequently are of little value when salts and carbonaceous matter may be present. It is therefore advisable when determining the strength of the residue acid from the treating of petroleum distillates, to dilute a weighed or measured portion of the sludge with water and titrate, in the presence of an indicator, with standard sodium hydroxide solution.

While 45° Be., or 55.07 per cent sulphuric acid, might be considered good for the strength of the spent acid it is not the quantity of sulphuric acid that actually governs but the formation of coloring compounds which tend to contaminate the product. The refiner may attempt to get the most out of the acid only to find that his product is off color.

DISCOVERY AND COMMERCIAL VALUE OF HELIUM

When and where was helium first found? Is there any other use for it than filling airships? Will a helium gas well, 10,000 feet daily, be of commercial value and is there a market for helium gas? This gas is entirely odorless and will not burn.—H. A. J. and C. F. B.

In 1868 Sir J. N. Lockyer discovered a new line in the spectrum of the sun's chromosphere not identical with any line in the spectrum of any known earthly substance. This he considered was due to the presence of a gas which he called helium, from the Greek word, the sun. In 1903 Lord Rayleigh and Sir William Ramsey found it in the rare gases associated with nitrogen in the atmosphere and later showed it to be a disintegration product of radium. Cady and McFarland, of the University of Kansas, were the first, in 1907, to find helium in natural gas. These investigations reported from 0.5 to 1.84 per cent in the several samples of gas examined.

There is helium in the atmosphere to the extent of one part to 185,000. It is found in older rocks and minerals—cleveite, monazite, fergusonite and others; in gases evolving from mineral springs, in natural gas; in sea and river water in limited quantities.

The bulk of helium produced is used for filling airships of the Army and Navy. The new airship Akron requires a supply of over 6,000,000 cubic feet. The Government has its own plant, located near extensive reserves at Amarillo, Tex., operated by the Bureau of Mines.

Although the Amarillo plant has been in operation less than three years, it has produced more than 22,000,000 feet of helium at an average net cost for that period of $11.47 per 1,000 feet. An indication of present improved plant performance is given in production figures for June, 1931, when the net cost of $5.95 per 1,000 feet was attained.

This plant furnishes all of the helium for the Army and Navy, and is one of the Government's most self-contained units. When present negotiations are completed the bureau will own the gas rights in an entire virgin gas structure underlying some 50,000 acres.

Not more than 16 years ago, helium was an extremely rare gas, only a chemical curiosity. There was not a cubic foot of it in the United States, though small amounts had been sold at the rate of $2,500 per foot. At that price, to have filled a ship the size of the Akron would have cost more than $16,000,000,000. The present cost of production is a good example of what may be accomplished by applied research.

Aside from its use in the lighter-than-air craft, it has several other commercial applications, among them the measurement of very low temperatures, filling of radio tubes, and several special uses. Because of its high conductivity of heat, helium may be used as a medium for circulation in heating and refrigeration systems. Helium used as a preservative of food keeps other gases, which encourage decay, from reaching the food.

It would be advisable to establish the helium content of any natural gas, such as you mention. Unless helium were found in exceptional quantities, it probably would not pay, under existing conditions, to extract it.

DOUBLE A AND OTHER NATURAL GASOLINE SPECIFICATIONS

What are the Double A casinghead gasoline (natural gasoline) specifications?—W. C. F.

The Natural Gasoline Association of America adopted a new set of specifications for the grading of natural gasoline, December 10, 1930, which are to become effective January 1, 1932. There are 24 grades arranged on the basis of vapor pressure at 100° F. and percentage evaporated at 140° F. and 275° F. There are additional requirements including negative corrosion, a sweet doctor test and a color of 25 Saybolt.

The Double A grade is specified as follows:

Gravity—80 to 87.9 A.P.I.
Endpoint—Not over 375° F.
Recovery—Not less than 90 per cent.

No direct comparison of the old grades with the new is possible, but an investigation of the material marketed shows the following:

NATURAL GASOLINE SPECIFICATIONS COMPARED

New grade	Old grade
26-70	Predominantly Grade AA
30-70	Predominantly Grade BB, considerable Grade AA
26-55	Predominantly Grade AA
22-55	Predominantly Grade AA
30-55	Grades AA, C and BB chiefly
22-70	Predominantly Grade A, some BB
34-70	Predominantly Grade BB, some C
22-40	Grades A and AA
34-55	Predominantly Grade C

The revised specifications were fully discussed, with the grades tabulated, in The Oil and Gas Journal, December 25, 1930, page 30.

Snapped Here and There By The Journal's Cameras

1—Tom B. Reed, Great Southern Life Insurance Company, and Douglas Rowland, president, Star Manufacturing Company, Oklahoma City, Okla. 2—William Grove, farm boss, Charles Know Oil Company, Covington, Okla. 3—J. I. Gearcld, trucking contractor; E. F. Cumpton, driver; and T. K. Duckwall, clerk, Parkersburg Rig & Reel Company. 4—Helen I. Bettes, secretary, and R. C. Grinnell, president, Fluid Pack Pump Company, Oklahoma City, Okla. 5—Frank Hollman, district manager; F. J. Bradford, Jr., storeman; George L. Bradford, salesman, Kirk Morrow Iron Works, Kilgore, Tex.

LOUISIANA-ARKANSAS PROVEN AREAS

(Continued from Page 38)

W. M. Coates' No. 3 Hale, Sec. 1-7-13 ..... Rigging up.
W. F. Lacy's No. 1 Holliday, Sec. 35-8-12, 330 ft. N and E, SW cor. SE NW ..... Began Nov. 15; set 10-in. 105 ft.
Ohio Oil Co.'s No. 13 Bowman-Hicks, Sec. 35-8-12, 2,310 ft. N, 525 ft. W, SE cor. Sec. ..... Began Nov. 15; set 10-in. 196 ft.
Pelican Nat. Gas Co.'s No. 11 Louisiana Long Leaf Lbr. Co., Sec. 10-7-11, 330 ft. N and W, SE cor. NE NW.... Began Oct. 14; set 10-in. 102 ft; drlg. 200 ft.
Smith et al's No. 1 Hale, Sec. 1-7-13, 330 ft. S and W, NE cor. NW SE ..... Began Nov. 13; set 10-in. 103 ft; drlg. 450 ft.
A. F. Tarver's No. 2 Cutrer, Sec. 12-7-11, 330 ft. S and W, NE cor. NW NW ..... Began Nov. 12; set 10-in. 100 ft; drlg. 1,900 ft.
O. J. Baird's No. 1 Duggan, Sec. 14-7-11, 328 ft. S, 648 ft. E, from center of Sec. ..... S.D. for water 2,000 ft.
Roy Baker's No. 1 Sabine Lbr. Co., Sec. 1-7-12 ..... W.O.S.R. 2,548 ft.
W. M. Coates' No. 1 Bowman-Hicks, 330 ft. S and W, of C, Sec. 2-7-12 ..... W.O.S.R. 2,441 ft.
Dengall O. & G. Co.'s No. 3 Nulton, 330 ft. N and E, SW cor. NW NE, Sec. 1-7-13 ..... Comp. 250 bbls. 2,067 ft.
O. A. Gautier et al's No. 1 Mischell, 330 ft. E, 150 ft. N, SW cor. SE NW, Sec. 36-8-12 ..... S.D.; W.O. 2,532 ft.
Hawkins & Antoon's No. 1 Newton, Sec. 1-7-11 ..... W.O.S.R. 2,609 ft.
Hudson & Bird's No. 1 Walden, 480 ft. N, 300 ft. E, SW cor. SW NE, Sec. 26-8-11 ..... S.D. 1,800 ft.
M. J. Kissick's No. 1 Brown Lbr. Co., Sec. 1-7-11, 1,-070 ft. S, 1,225 ft. E, NW cor. NE ..... S.D. for water 900 ft.
Zeke Lohman's No. 1 McCormick, 660 ft. E, 330 ft. N, SW cor. NE SW, Sec. 2-7-11 ..... S.D. 1,606 ft.
Loring Oil Co.'s No. 18 Bowman-Hicks, 1,280 ft. S, 275 ft. E, NW cor. SW NW, Sec. 15-7-12 ..... Set 9⅝-in. 3,950 ft.
Lyons & Neely's No. 3 Byrd, Sec. 1-7-11 ..... S.D.; fishing 800 ft.
L. K. McGuffin's No. 1 Bush, NW cor. NW SE, Sec. 1-7-11 ..... S.D. 400 ft.
Ben Merritt, tr.'s No. 3 Byrd, Sec. 1-7-11 ..... S.D. 88 ft.
Ohio Oil Co.'s No. 12 Bowman-Hicks, Sec. 2-7-12, 150 ft. N and W, SE cor. NE NE ..... W.O.S.R. 2,271 ft.
H. W. Perritt's No. 6 Bowman-Hicks, Sec. 2-7-12, 150 ft. S and W, NE cor. SE NE ..... Drlg. 1,700 ft.
Eddie Self's No. 2 Jacob, Sec. 1-7-11 ..... Drlg. 2,496 ft.
Stovall, tr.'s No. 2 Nulton, 241 ft. N, 330 ft. W, SE cor. NE NW, Sec. 1-7-13 ..... Running sand pump 2,474 ft.

UNION PARISH

Interstate Nat. Gas Co.'s No. 27-C Howard, 660 ft. S and E, from C, Sec. 32-20-3e ..... Set 6-in. 2,188 ft.
Nemours Corp.'s No. 1-C Harrell, Sec. 7-20-4e, 1,980 ft. S and E, of NW cor. ..... Drlg. 2,090 ft.
Stovall Gas Co.'s No. 2 Howard, Sec. 32-20-3e, 1,320 ft. S, 1,980 ft. W, NE cor. ..... Set 6-in. 2,132 ft.

ARKANSAS

UNION COUNTY—EL DORADO

Lion O. & R. Co.'s No. 9-A G. P. Hayes, 242 ft. S, 246 ft. W, NE cor. Lot 5, NE, Sec. 4-16-15 ..... Drlg. salt rock 6,662 ft.
Southern Prod. Co.'s No. 1 Wingfield, NE cor. SE NW, Sec. 16-19-15 ..... S.D. 2,608 ft.

UNION COUNTY—URBANA

Marine Oil Co.'s No. 1 Winn est., 330 ft. S and E, NE cor. S½ NW, Sec. 11-18-13 ..... T.A. 3,586 ft.
Marine Oil Co.'s No. 2-E Thompson, 330 ft. N, 330 ft. E, SW cor. NE NE, Sec. 10-18-13 ..... Location.
Wilson & Chapman's No. 1-B Hadley, Sec. 3-18-13, 330 ft. S and W, NE cor. SE NW ..... Drlg. shale 3,400 ft.

EAST TEXAS

PANOLA COUNTY

Daisy O. & G. Co.'s No. 1 Rucks, Jno. Palmer Sur. ..... S.D. 3,270 ft.
Dillon & Braham's (was W. G. Banks et al's) No. 1 C. O. Baldwin, 1,395 ft. W, 1,362 ft. S, NE cor. Baldwin 200 ac. in Hampton West Sur. ..... S.D. 1,555 ft.
Nat. Gas. Prod. Co.'s No. 8 Floyd, 50 ft. S and 100 ft. W from No. 1 Floyd, Ben C. Jordan Sur. ..... Rigging up.
United Prod. Corp.'s No. 17 Steele, 1,320 ft. N, 660 ft. W, SE cor. C. D. Steele lse., in B. C. Jordan Sur..... Location.

MISSISSIPPI

HINDS COUNTY

James Alexander, trustee's No. 1 Casey, Sec. 12-5n-1e, 1,425 ft. E, 496 ft. S, NW cor. SW ..... Set 10-in. 115 ft.; set 6⅝-in. 2,380 ft.
Ferguson-Fuller et al's No. 1 Sours et al, Sec. 34-6n-1e, 665 ft. E, 50 ft. S, NW cor. SW ..... Fishing 2,295 ft.
Howie & Howie's No. 1 fee, Sec. 34-6-1e, 400 ft. E, 570 ft. S, NW cor. SW SW ..... Drlg. Wilcox 2,321 ft.
Love Pet. Co.'s No. 1 Interior Lbr. Co., Sec. 2-5n-1e, 90 ft. W, 270 ft. N, SE cor. SW ..... Derrick.
Millsaps College's No. 1 fee, Sec. 34-6n-1e, 2,225 ft. N, 1,412 ft. W, SE cor. Sec. ..... Location.

RANKIN COUNTY

Anderson et al's No. 1 Brown, Sec. 12-5n-1e, 166 ft. E, 788 ft. S of center of section ..... Rigging up.
Cummins & Montgomery's No. 1 Ivey, Sec. 13-5n-1e, NE Lot 10, Blk. D, E. Jackson Pl., first addn. .... Derrick pattern.
J. E. Grandstaff et al's No. 1 East, Sec. 12-5n-1e, 1,-180 ft. W and 515 ft. N, SE SW ..... Completed, estimated 25,000,000 ft. gas; T.D. 2,382 ft.
McGuire et al's No. 1 Motor, Sec. 12-5n-1e, 1,763 ft. N, 1,800 ft. W, SE cor. ..... Set 6⅝-in. 2,365 ft.
Muse & Muse's No. 1 Seany, Sec. 12-5n-1e, 2,670 ft. E, 375 ft. S, NW cor. SW ..... Rigging up.
Muse & Muse's No. 1 Wright, Sec. 12-5n-1e, 169 ft. W, 1,163 ft. N, SE cor. SW ..... Set 6⅝-in. 2,368 ft.
Pioneer Oil & Gas Co.'s No. 1 Green, Sec. 12-5n-1e, 180 ft. W, SE cor. SW SW ..... Derrick.
Pioneer Oil & Gas Co.'s No. 1 C. M. Motor, Sec. 12-5n-1e, 937 ft. N and E SW cor. section ..... Derrick.

WILDCAT OPERATIONS IN MISSISSIPPI

CLARKE COUNTY

Company, farm and location—	Remarks:
Gulf Ref. Co.'s No. 1-A Long Bell Lbr. Co., C SW SW, Sec. 10-2n-16w	Coring red shale 4,150 ft.

HINDS COUNTY

Atkins et al's No. 1 Crane Lawrence, Sec. 23-6n-1e, 300 ft. E, 132 ft. N, SW cor. NE SE ..... Derrick.
Howard Oil Co.'s No. 1 Jackson College, C NW NW, Sec. 9-5-1e ..... S.D. 74 ft.
Ridgeway & McGehee, Inc.'s No. 1 Mosal, Sec. 24-6n-1e, 200 ft. N, 100 ft. E, SW cor. of E½ SW ..... Derrick.
Southern Pet. Co.'s No. 1 Wilson (was Tri-State O. & G. Co.'s), 320 ft. E, 340 ft. N, SW cor. SE NE, Sec. 28-6-1e ..... S.D. 20 ft.; W.O.
F. E. Stewart et al's No. 1 Miss. Cotton Seed Products Co., Sec. 4-5n-1e, 320 ft. S and 440 ft. W of NE cor. SE ..... Derrick.

HUMPHREYS COUNTY

Danciger O. & G. Co.'s No. 1 Belgrade Lbr. Co., C NW, Sec. 29-14n-4w ..... S.D. for fuel 2,988 ft.

JASPER COUNTY

Bay Springs Pet. Co.'s No. 1 Keyes, C NW NE, Sec. 2-12-9 ..... S.D. 2,360 ft.

LOWNDES COUNTY

Lowndes County Oil & Dev. Co.'s No. 1 Carr est., Sec. 34-17-16e, 1,320 ft. E, 330 ft. S, NW cor. Sec. ..... Derrick.

MONROE COUNTY

Amory Dev. Co.'s No. 1 Bourland, Sec. 2-13-19 ..... S.D. 3,015 ft.
McAlpine et al's No. 1 Cowart, second hole, Sec. 2-12-19.. T.A. 3,793 ft.

NEWTON COUNTY

Bob Dalton's No. 1 Majure, 400 ft. N, 300 ft. E of SW cor. SE, Sec. 25-6n-11e ..... S.D. 847 ft.

NOXUBEE COUNTY

Thompson & Donohue's No. 1 Donohue, Sec. 25-16n-17e.. S.D. 1,735 ft.

RANKIN COUNTY

Attkisson & Dyer's No. 1 Valentour, 200 ft. S, 200 ft. E, NW cor., Sec. 18-5n-2e ..... S.D. 1,740 ft.
Gulf Ref. Co.'s No. 1-A Hanna, Sec. 23-6n-1e ..... Drlg. 3,085 ft.
Majestic O. & G. Co.'s No. 1 Elton Lbr. Co., Sec. 10-4n-3e. Derrick.
Square Deal O. & G. Co.'s No. 1 Spann, NW cor. SE NE, Sec. 13-5n-1e ..... Drlg. plug 2,495 ft.
United Gas Public Service Co.'s No. 1-A McLaurin, 3,-950 ft. E, 660 ft. S, NW cor. SW, Sec. 8-5n-2e ..... Coring red beds 3,282 ft.

SCOTT COUNTY

M. U. Culley et al's No. 1 Owens, Sec. 2-8-9 ..... Derrick.

WARREN COUNTY

Eagle Bend O. & G. Co.'s No. 1 Kiger, SW cor. SW SE, Sec. 9-18-3 ..... S.D. 2,607 ft.
United Gas Public Service Co.'s No. 1 Tchula Co-Operative Store, 1,980 ft. W, 660 ft. N, SE cor. SE, Sec. 33-15n-3e ..... Drlg. 3,474 ft.

WEBSTER COUNTY

P. J. McAlpine's No. 1 Henly (was Cumberland Oil Co.'s No. 1 Healy), SE NW, Sec. 15-21n-11e ..... S.D. 1,800 ft.

WINSTON COUNTY

Miss. Drlg. Co.'s No. 1 Scarbrough, NW cor., Sec. 15-12-14 ..... Dry and abnd. 4,039 ft (corrected.)

WILDCAT OPERATIONS IN LOUISIANA-ARKANSAS

(Continued from Page 38)

MOREHOUSE PARISH

United Gas Public Service Co.'s No. 2 Sandidge, Sec. 11-20n-4e, 656 ft. S, 1,332 ft. W NE cor. NW ..... Location.

NATCHITOCHES PARISH

Dr. H. S. Gerson, No. 1 Smith, Sec. 11-10-8, 2,000 ft. N of NE cor of irregular Sec. 10 in Sec. 11 ..... Began Nov. 4; S.D. 50 ft.
Cooper et al's No. 2-A Cooper, C SE SE, Sec. 32-11-10 .. S.D. 1,518 ft.
R. A. Keaton's No. 1 Stephens, Sec. 25-10-6, 320 ft. N and W, SE cor. NW NW ..... Set 12½-in. 178 ft.
Mid-West Prod. Co., Inc.'s No. 1 H. Brown, Sec. 34-11-10, 200 ft. W, 230 ft. S, NE cor. SE ..... Drlg. 1,150 ft.
C. M. Talley et al's No. 1 C. M. Talley, 1,980 ft. W, 660 ft. S, NE cor. SE, Sec. 29-11-10 ..... S.D. 1,380 ft.

OUACHITA PARISH

Wilson & Mitchell's No. 1 Williams, Sec. 5-16-1e, 330 ft. E, 240 ft. S, NW cor. SW SE ..... Set 12-in. 180 ft.

RED RIVER PARISH

La. Oil Dev. Co.'s No. 2 La. Delta Pecan Co., 2,950 ft. S, 300 ft. E, NW cor., Sec. 27-13-11..... Spudded in; S.D. 50 ft.
Mack Jourden Co.'s No. 1 Lockett, 4,035 ft. S, 1,080 ft. E, NW cor. SW, Sec. 29, in Sec. 32-13-10 ..... W.O.S.R. 2,750 ft.

RICHLAND PARISH

Alto Gas Co.'s No. 2 Hunt, 660 ft. S and E, NW cor., Sec. 13-17-5 ..... Derrick.
National Gas Co.'s No. 1 Singletary, 1,980 ft. N, 660 ft. W, SE cor., Sec. 20-18n-7e ..... S.D. 2,515 ft.
Southern Carbon Co.'s No. 1-B C. M. Noble, 2,966 ft. N, 1,525 ft. W, cor. Secs. 7, 8, 17 and 18, in Sec. 37-15-6.. Location.

SABINE PARISH

W. M. Coates' No. 1 Stille, 330 ft. N, 660 ft. W, SE cor., Sec. 35-8-13 ..... Derrick.
Davidson & Grigsby's No. 1 Martinez, Sec. 2-7-13, 330 ft. S and W, NE cor. NW SE ..... Rigging up.
Exchange Pet. Co.'s No. 1-B Louisiana Long Leaf Lbr. Co., Sec. 35-8-11, 300 ft. N and E, SW cor. NE NW.. Set 10-in. 102 ft.; drlg. 740 ft.
R. L. Gay, tr.'s No. 1-A Long Bell Lbr. Co., 430 ft. S, 200 ft. W, NE cor. NW NW, Sec. 10-8-13 ..... S.D. 3,852 ft.
Gehrig Oil Co.'s No. 1 Skinner, Sec. 16-8-11, 615 ft. E, 565 ft. S, NW cor. NW ..... S.D. for water 104 ft.
W. M. Coates' No. 1-A Bowman-Hicks, 330 ft. S and E, NW cor. SW SW, Sec. 18-7-13 ..... Dry and abnd. 2,600 ft.
T. M. LeGrand's No. 1 Peterson, 330 ft. N and E of C, Sec. 34-7-13 ..... Arranging to set 6-in. 2,243 ft.
J. J. Keen, tr.'s No. 1 Belton (no check), Sec. 31-9-13 ... S.D. 2,039 ft.
A. H. Thames' No. 1 Edward est., 150 ft. NW SE cor. NE SE, Sec. 8-8-13 ..... S.D. 1,200 ft.

TENSAS PARISH

U. A. Duvall et al's No. 1 Martin Jacob, 150 ft. S, 150 ft. W, NE cor., Sec. 1-14-11e ..... S.D. 3,060 ft.
A. R. Willis et al's No. 1 Currey, 1,320 ft. S, 1,320 ft. E, NW cor., Sec. 39-11-12 ..... S.D. 3,545 ft.

ARKANSAS

COLUMBIA COUNTY

Kendall Oil Co.'s No. 1 Fullenweider, Rhea & Kitchen, Sec. 13-17-22 ..... S.D; W.O. 814 ft.

CLAY COUNTY

S. C. Jeffus' No. 1 Underwood, 510 ft. N, 350 ft. W, C, NW SE, Sec. 4-20-3 ..... Reaming 1,350 ft.

CLEVELAND COUNTY

Crum & Stillwell's No. 1 E. R. Bell, Sec. 10-10s-12w .... Rigged up and S.D.

CLEBURNE COUNTY
(Cable tools)

Donnelly-Craver et al's No. 1 Donophan Lbr. Co., SE cor. NW, Sec. 33-11-9 ..... Reaming 2,050 ft.; T.D. 3,740 ft.

CRAWFORD COUNTY

Ozark Nat. Gas Co.'s No. 1 Hammond, C SE SE, Sec. 29-10-29 ..... Set 6⅝-in. 1,385 ft.; T.D. 2,004 ft.

DALLAS COUNTY

E. C. Brewer's No. 1 W. E. Hillman, 330 ft. E, 40 ft. S, NW cor. SE NE, Sec. 20-10-13 ..... S.D.; W.O. 2,869 ft.
J. H. James, tr.'s No. 1 Fordyce Lbr. Co., 200 ft. S, 200 ft. E, NW cor. NE, Sec. 11-9-15 ..... S.D. funds 2,520 ft.
Zepp O. & G. Co.'s No. 3 Hillman, Sec. 20-10-13, 180 ft. N, 450 ft. E, SW cor. NW NE ..... Location.

DREW COUNTY

Co-Operative Development Co.'s No. 1 Ogles, Sec. 35-15-5, 330 ft. S and E, NW cor. NE NW ..... Set 10-in. 156 ft.; drlg. 1,000 ft.

HOT SPRINGS COUNTY

Star Oil Co.'s No. 1 Cunningham, 285 ft. S, 285 ft. W, NE cor., Sec. 11-5-16 ..... S.D. 1,300 ft.

LINCOLN COUNTY

Lawrence Cook, tr.'s No. 1 McGhee Planting Co., 420 ft. S, 200 ft. W, NE cor. NE SW, Sec. 5-8-7 ..... S.D. 2,800 ft.

OUACHITA COUNTY

Wilson & Chapman's No. 1 Lambert, Sec. 10-15-16, 600 ft. S, 150 ft. E, NW cor. SE SE ..... Location.

LITTLE RIVER COUNTY

Roberts Oil Co.'s No. 1 H. J. Russell, 330 ft. E, 330 ft. S, NW cor., Sec. 25-12-19 ..... Location.
Stephens et al's No. 1 Dierks Lbr. Co., Sec. 29-12s-31w, 160 ft. S, 330 ft. E, NW cor. NE NW ..... Rigging up.

LOGAN COUNTY

J. H. Flowers' No. 1 J. H. White, Sec. 13-6-26 ..... S.D.; W.O. 3,570 ft.

MILLER COUNTY

W. E. Noel et al's No. 1 Dickson hrs., 1,980 ft. W, 660 ft. S, NE cor., Sec. 11-20-27 ..... S.D. 1,955 ft.

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Perfect Balancing
of
Gas Supply

Accuracy and safety in control of gas delivery is the especially chosen task of The Chaplin-Fulton Manufacturing Company and has been for forty-five years. There are 40 different types of Regulators, which meet a hundred times as many varying services, bearing the stamp of Chaplin-Fulton Manufacture. Each of these Chaplin-Fulton Regulators is reliable for three chief reasons:

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***Second*—It is efficiently and scientifically constructed to perform its service satisfactorily.**

***Third*—It represents in superior accuracy and reliability the long accumulation of knowledge by the first firm in this country to manufacture gas regulators.**

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PITTSBURGH, PA.

OUACHITA COUNTY

Copenhaven et al's No. 2 Berg, C SE SE, Sec. 13-15-17...S.D. for fuel 2,011 ft.
M. S. M. Oil Co.'s No. 4 Arnold & Doyle, Sec. 23-16-15, 200 ft. S and E, NW cor. SW SE ..... Recementing 6-in. 2,018 ft.

PIKE COUNTY

E. R. Henderson's No. 1. Tilyou, 660 ft. W, 500 ft. S, NE cor. NE SE, Sec. 26-8-14 ..... T.A. 2,909 ft.
E. R. Henderson's No. 1 J. L. Lee, 400 ft. S, 350 ft. E, NW cor. SW SE, Sec. 31-8-24 ..... S.D.; W.O. 1,020 ft.
E. R. Henderson's No. 1 W. B. East, 200 ft. S, 150 ft. W, NE cor., Sec. 13-9-23 ..... S.D. 338 ft.

PRAIRIE COUNTY

Powell Creek O. & G. Co.'s No. 1 Kloss, NE SW, Sec. 3-4n-6w ..... Partly rigged up and S.D.

SCOTT COUNTY

Heavener O. & G. Co.'s No. 1 Riser, Sec. 36-4-26 ..... S.D.; T.D. 1,436 ft.
Waldron O. & G. Co.'s No. 1 White, NE cor. SW NW, Sec. 17-3n-29 ..... S.D.; waiting on csg. 1,860 ft.

SEVIER COUNTY

Tristate Oil Co.'s No. 1 McCown, Sec. 34-8-32, S½ SW ... Partly rigged up and S.D.

UNION COUNTY

Drillers Oil & Dev. Co.'s No. 1 Pickering, 220 ft. N, 668 ft. E, SW cor. NW NE, Sec. 1-17-16 ..... Plugging hole 2,134 ft.
H. H. Helms' No. 1 C. H. Murphy, NE cor. NW NE, Sec. 31-16-14 ..... Rigging up.
Joe Modisette et al's No. 1 W. D. Webb, Sec. 6-18-13, NE cor. NW SE ..... Drlg. shale 3,290 ft.
Sunby et al's No. 2 Perdue, Sec. 33-16-14, 75 ft. S. 150 ft. E, NW cor. Sec. ..... W.O. 3,247 ft.

WASHINGTON COUNTY
(Cable tools)

C. H. Willoughby's No. 1 Jones, Sec. 34-16-30 ..... S.D. for funds 1,795 ft.

YELL COUNTY
(Cable tools)

Tegmeir & Luckett's No. 1 Falcon, Sec. 36-7-21 ..... S.D. 5,710 ft.

EAST TEXAS

BOWIE COUNTY

Hindeman & Bell's No. 1 Merritt (was Maud-Redwater Oil Co.'s), 175 ft. N, 175 ft. E, SE cor. G. W. Hardidge 100-ac. tr. on Floyd Merritt tr. in Y. S. McKinney Sur. ..... S.D. 3,310 ft.
Logan & Elliott's No. 1 Smith, 9,600 ft. S, 2,500 ft. W, NE cor. Chas. Lewis Sur. ..... S.D. 4,505 ft.
Tarkington & Jones' No. 1 W. W. Whybark, 200 ft. S, 200 ft. W, SW cor. J. H. Dyer Sur. ..... Reaming 1,510 ft.
Lee Timberlake et al's No. 2 Tidwell, 2,510 ft. N, 655 ft. W, SE cor. T. M. Rice Sur. ..... S.D. 3,000 ft.

CAMP COUNTY

McDonald Bros.' No. 1 Tillery, 150 ft. E, 450 ft. S, NW cor. 127-ac. tr. in J. H. Murphy Sur. ..... S.D. 3,600 ft.

CASS COUNTY

J. F. Morrisey's No. 1 T. J. Wilson, 1,088 ft. S of N line, 2,376 ft. E of W line of H.R.S., J. R. McFarland Sur. ..... S.D. 3,670 ft.
Davis & Pigg's No. 1 Roy Bryan, SW cor. Roy Bryan 88-ac. tr., Albert H. Latimer Sur. ..... S.D. 2,055 ft.
Everets Drlg. Co.'s No. 1 H. W. Whittington, 200 ft. S and W, NE cor. 69-ac. Whittington tr., L. Strong Sur. ..... S.D. 3,922 ft.
Geo. McKamie's No. 1 R. E. Hall, 150 ft. N, 150 ft. W, SE cor. Hall's 117-ac. tr., H. Buckler Sur. ..... S.D. 4,195 ft.
C. E. Murdock's No. 1 First National Bank, Evans Watson Sur. ..... S.D. 4,390 ft.
John C. Rogers' No. 1 L. E. Lanier, 573 ft. N, 879 ft. W, SE cor. Lanier 86 ac. in K. E. Welborn Sur. ..... S.D. 2,280 ft.
Olds & King's No. 2 Anthony, John C. Byers Sur. ..... S.D. 1,750 ft.
John C. Rogers et al's No. 1 W. Q. Henderson, 3,100 ft. S, 3,100 ft. E, NW cor., Wm. Davis Sur. ..... S.D. 955 ft.

HARRISON COUNTY

Lloyd Oil Corp.'s No. 1 E. S. Timmons, 150 ft. from N line to 250 ft. from E line of 105-ac. tr., Findley Sur. ..... Reaming 4,025 ft.
Ryan Consolidated Pet. Corp.'s No. 1 J. M. Fuhr, 1,300 ft. N of NW cor. T. J. Copelin Sur., 1,675 ft. SW at right angles to NW SE line of O'Neal Sur.... Derrick.

MARION COUNTY

Geo. Hindeman et al's No. 1 F. V. Lindsey, 2,500 ft. S, most northerly N line, 3,555 ft. E most easterly W line, Alexander Albright Sur. ..... S.D. 2,380 ft.

PANOLA COUNTY

Hoffer et al's No. 1 Cameron Lbr. Co., center 1,306-ac. tr. in W. M. A. LaGrove Sur. ..... Derrick.
Moses & Wallace's No. 1 Daniel, 600 ft. N and W lines, Mrs. Gerrell 100-ac. tr., SW cor. Isabel Hanks Sur.... Spudded and S.D.
G. A. Davidson's No. 1 Latham, Wm. Rich Sur. ..... S.D. 1,548 ft.
J. L. Nelson et al's No. 1 J. W. Williams, 300 ft. S, 700 ft. W, NE cor. Williams' 67-ac. tr. in Jas. Hanks Sur. ..... S.D. 2,250 ft.
United Gas Public Service Co.'s No. 11 Werner, 3,162 ft. N, 2,418 ft. W, SE cor. D. B. Lewis Sur. ..... Fishing 4,916 ft.

RED RIVER COUNTY

D. M. Buffington's No. 1 Hossler, E. Hughhart Sur. .... S.D. 2,795 ft.
Johnson Pet. Co.'s No. 2 Randolph, Edw. Dean Sur. .... S.D. 2,280 ft.

SHELBY COUNTY

E. L. Chapman's No. 1 Pickering Lbr. Co., C. E. Henry (headright) ..... Drlg. plug; reaming to bottom 3,864 ft.
Chapperell Oil Co.'s No. 2 Holt, Matthew Moore Sur. .... Arrng. resume drlg. 3,127 ft.
Harry Elliott's No. 1 Pickering Lbr. Co., 1,000 ft. N, 150 ft. E, SW cor. 361-ac. tr., G. H. Patterson Sur.... Set 10-in. 108 ft.
K. H. Francis' No. 1 John Mima, Mary Smith Sur. ..... Set 6⅝-in. 2,817 ft.
H. H. Gracey's No. 1 J. A. Morrison, 1,500 ft. N, 200 ft. E, SW cor. J. A. Morris' 109-ac. tr., Wm. English Sur. ..... S.D. 2,600 ft.
Henry Maulding's No. 1 Frost Lbr. Co., NE cor. Frost Lbr. Co.'s 80-ac. tr., A. D. Fountain Sur. ..... S.D. 3,246 ft.
McRoby et al's No. 1 Windham, Wm. Leach Sur., on Windham 296-ac. tr. ..... Drlg. chalk 3,120 ft.
Ridgeway et al's No. 1 Polley, Domingo Gonzales Sur., 3,180 ft. E of SW cor., 160 ft. N at right angles of Polley 457-ac. tr. ..... Arrng. to set 8-in. 822 ft.
C. H. Tautenhahn's No. 1 J. C. Bogard, 300 ft. S, 900 ft. E, NW cor. J. C. Bogard's 52-ac. tr., Thomas Baker Sur. ..... S.D. 20 ft.
Tenant et al's No. 1 J. Henry, C. Z. Walker Sur. ..... S.D. 3,457 ft.
United North & South Prod. Co.'s No. 1 Windham, 800 ft. W, 1,050 ft. N, SE cor. of Windham 171.5-ac. tr. on A. H. English Sur. ..... Coring 3,404 ft.

SOUTHWEST TEXAS PROVEN AREAS

(Continued from Page 42)

CAMP POOL—GUADALUPE COUNTY

Humble Oil & Refining Co.'s No. 2-C Sue Denman, 900 ft. N, 450 ft. E of SW cor. of lease and 450 ft. N, 300 ft. E, 1-C, William Arrington Sur. ..... T.D. 2,523 ft.; set csg.

DARST CREEK—GUADALUPE COUNTY

The Texas Company's No. 7 Henry Willie, 450 ft. to W line, 150 ft. to S line of farm, J. C. Darst Sur..... Rigging up.
The Texas Company's No. 4 R. A. Parrish, 450 ft. to W line, 150 ft. to N line of farm, J. C. Darst Sur. ... Set surface csg.
The Texas Company's No. 7 L. Anderson, 600 ft. to N and E lines of farm, J. C. Darst Sur. ..... Rigging up.

HENNE-WINCH-FARISS POOL—JIM HOGG COUNTY

O. W. Killam's No. 2 Lopez, 150 ft. to E line, 380 ft. to N line of Sur. 255 ..... T.D. 1,500 ft.; drlg.

CARTWRIGHT POOL—LIVE OAK COUNTY

Houston Oil Co.'s No. 14 Cartwright, 1,000 ft. W of No. 23 Cartwright ..... T.D. 5,400 ft; standing.

CHITTIM POOL—MAVERICK COUNTY

Texas Gas Utilities' No. 8 Chittim, 24 ft. S of No. 7 Chittim ..... T.D. 4,850 ft.; no report.

SAXET FIELD—NUECES COUNTY

Gulf Coast Oil Co.'s No. 1 Sagarin ..... T.D. 4,750 ft.; drlg.
Gulf Coast Oil Co.'s No. 1 Elder, NW of same company's No. 1 Harrell ..... T.D. 5,000 ft.; drlg.
Houston Oil Co.'s No. 1-A T. M. Harrell, 330 ft. to N and E lines of tract in H. B. Sheppard Sur. ..... Location.
Veal-Milton and Kepley Pet. Co.'s No. 1 J. N. Roark, 200 ft. to S line, 200 ft. to E line of 106-ac. tr. ..... T.D. 4,850 ft.; bailing.

Saxet Oil Co.'s No. 3 Donigan, north offset to Zoch's No. 1 Baldwin ..... Location.
Saxet Oil Co.'s No. 5 Weil, 3,041 ft. to N line, 333 ft. to W line ..... Set surface csg.

WELDER FIELD—SAN PATRICIO COUNTY

Atlantic Oil Prod. Co.'s No. 1 Welder, 500 ft. to N and W lines, Blk. 3, P. R. Portillo Sur. ..... T.D. 500 ft.; set surface csg.

WHITE POINT POOL—SAN PATRICIO COUNTY

Saxet Oil Co.'s No. 18 Rachel ..... T.D. 1,425 ft.; drlg.

LOS OLMOS POOL—STARR COUNTY

Hooks & Weaver's No. 3 Kelsey-Bass, 1,050 ft. to W line, 1,800 ft. to S line, Blk. 2, Sub. of Porciones 75, 76, 77, Jurisdiction of Camargo, Sur. No. 6 ..... T.D. 515 ft.; drlg.
Jenkins & Powers' No. 1 Kelsey-Bass, Porcion 75 ..... T.D. 150 ft.; drlg.
Los Olmos Oil & Gas Co.'s No. 6 Kelsey-Bass, 150 ft. to W and S lines of north half of Blk. 5, Porciones 75, 76, 77, Jurisdiction of Camargo, Sur. No. 5 ..... T.D. 465 ft.; S.D.
Los Olmos Oil & Gas Co.'s No. 7 Kelsey-Bass, three-fourths mile NE or No. 6 ..... Set and cmt. csg.; waiting on cmt.
L. L. Smith No. 1 Kelsey-Bass, Blk. 8 sub. Porciones 75, 76, 77, Jurisdiction of Camargo ..... Location.
Rio Oil & Ref. Co.'s No. 1 Kelsey-Bass (formerly carried as Los Olmos O. & G. Co.'s No. 1 Kelsey-Bass) ... T.D. 878 ft.; changing to heavy rig to deepen.
Rio Oil & Ref. Co.'s No. 2 Kelsey-Bass, W offset to Hooks & Weaver No. 1 ..... T.D. 135 ft.; drlg.
San Marcos Oil Co.'s No. 2 J. F. Ivey, 1,800 ft. to N line, 200 ft. to E line, Share 8, Sub. W two-thirds of Porcion 75, Jurisdiction of Camargo ..... T.D. 218 ft.; drlg.
San Marcos Oil Co.'s No. 3 Kelsey-Bass, 450 ft. W of No. 2 ..... T.D. 55 ft.; drlg.

CAROLINA-TEXAS POOL—WEBB COUNTY

Carolina-Texas O. & G. Co.'s No. 10 Barnsley, 150 ft. to E line, 200 ft. to S line of Blk. 14, Sur. 268 ..... Derrick.
Luther Carson's No. 5 Webster, 150 ft. to N and W lines of NW quarter of SE quarter of Sur. No. 684 ..... T.D. 3,065 ft.; swabbing.

COLE POOL—WEBB COUNTY

D. W. Killam's No. 22 Bruni, 1,755 ft. to SW line, 186 ft. to NW line, Sec. 9 ..... T.D. 2,492 ft.; drlg.

ESCOBAS POOL—ZAPATA COUNTY

Claggett et al's No. 1 Cuellar, Blk. 6, Sur. 61 ..... Rigging up.
Gray & Chamberlain's No. 4 Garza, Blk. 1, Comitas grant. Making location.
T. K. Bateman's No. 1 M. Garza, in Comitas grant, 200 ft. to NW line, 660 ft. to NE line of Blk. 29 ..... 1,000 ft.; drlg.
Grayburg Oil Co.'s No. 1 F. G. Martinez, 150 ft. from S and W lines of 240-ac. tract in E½ of Sur. 4 ..... 1,100 ft.; drlg.
Newton, Owens & Evans' No. 1 Garza, 200 ft. to N and W line Block 4, Share 1, Sur. 161 ..... T. D. 150 ft.; drlg.
D. W. Killam's No. 10 A. Bustamente, 150 ft. to SE line, 200 ft. to NE line, Blk. 11, Share 5, Fansler Sub., Comitas grant ..... Rigging up.
Gray & Chamberlain's No. 4 Garza, Block 1, Comitas grant ..... Derrick.
Shankin & Murray's No. 2 Cuellar, 490 ft. W line, 150 ft. to N line, Blk. 5, Sur. No. 61 ..... Derrick.
H.R.C. Oil Co.'s No. 5-E Trevino ..... Building derrick.

KILLAM-CUELLAR POOL—ZAPATA COUNTY

D. W. Killam's No. 46-B Cuellar, 680 ft. to SW line, 4,100 ft. to E line, Sur. No. 277 ..... Spudded in.

CHARCO REDONDO POOL—ZAPATA COUNTY

Bob & Richey's No. 25 Martinez, 1,300 ft. from NE line, 1,090 ft. from SE line, Block 24, Dukes sub. Charco Redondo grant ..... Location.
Bob & Richey's No. 26 Martinez, 1,460 ft. to NE line 855 ft. to SE line, Blk. 24, Duke sub. Charco Redondo grant ..... Location.
Bob & Richey's No. 27 Martinez, 870 ft. to SE line, 150 ft. to NE line, Block 24, Duke sub. Charco Redondo grant ..... Location.

WILDCAT OPERATIONS IN SOUTHWEST TEXAS

(Continued from Page 42)

Tri-State Oil Co.'s No. 1 E. B. Carruth, 2,500 ft. from S line, 2,560 ft. from E line of tr. in F. Bolen Sur. ... T.D. 770 ft.
J. W. Blount's No. 1 S. A. Land Co., I. Perez Sur., 1,000 ft. to N line, 450 ft. to W line of tract ..... T.D. 350 ft.; drlg.

CALDWELL COUNTY

Lloyd North's No. 1 Keith McGee (previously carried as Ralph R. Lewis), 600 ft. from E and S lines of tr. in J. Pinchback Sur. ..... T.D. 200 ft.; drlg.
J. O. Rayor's No. 3 N. L. Dunlop, 350 ft. to NW line, 150 ft. to NE line of farm, Solomon Seal Sur. ..... T.D. 1,700 ft.; drlg.

DEWITT COUNTY

Gibson & Sturm's No. 1 Clark, Dolores Alderete Sur. .... Rigged up; standing.

DUVAL COUNTY

Thomas & Tarver, Inc.'s No. 1 Wood-Welder, 500 ft. to N line, 4,320 ft. to W line of Sur. No. 102 ..... T.D. 2,156 ft.; drlg. plugs.
J. J. Carpenter et al's No. 1 Juan Benavides, Blk. 33, Mesquite grant ..... T.D. 1,712 ft; standing.

FRIO COUNTY

A. H. Wray's No. 1 Roche, 330 ft. from N and W lines of NW SE, Sec. 123, A. Hutzler Sur. ..... T.D. 3,180 ft.; standing.

GUADALUPE COUNTY

Gray & Campbell's No. 1 Kruger, 150 ft. to E line and 150 ft. S of Guadalupe River ..... T.D. 2,326 ft.; drlg.
Barnhill et al's No. 1 H. L. Hoffman, 450 ft. to N and W lines of farm, in John G. King Sur. ..... T.D. 800 ft.; drlg.
Harry Bruner's No. 3 Jim Sherrill, 330 ft. from NW and SW lines of tr. in Geo. Allen League ..... T.D. 180 ft; standing.
Schleyer, Atherton and Armstrong's No. 1 Ogletree, Robert Smith Sur. ..... T.D. 1,745 ft; S.D.
H. W. Elser's No. 1 Wells, 2,790 ft. to W line, 150 ft. to S line of farm in Jose de la Baume Sur. ..... Rigging up.
J. M. Scott's No. 1 E. Drumm, 250 ft. to W line, 150 ft. to S line of tract, C. Campbell Sur. ..... Rigging up.

GOLIAD COUNTY

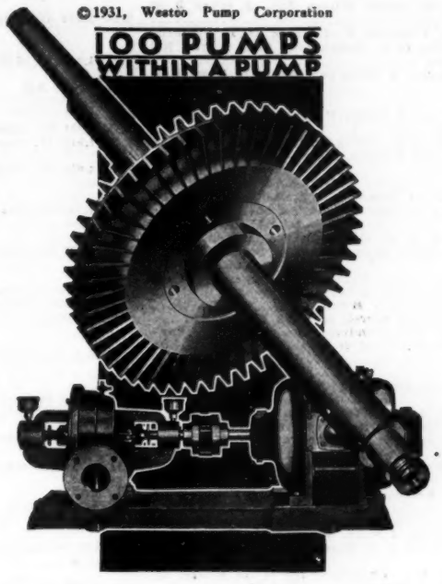
Plymouth Oil Co.'s No. 1 Parks, 5 miles NE Goliad ..... T.D. 3,900 ft.; drlg.
Veal et al's No. 1 J. M. Pettus, 10,700 ft. to S line, 2,500 ft. to E line of Pedro Trevino Sur. ..... T.D. 480 ft.; S.D.

JIM WELLS COUNTY

Manolind O. & G. Co.'s No. 1 N. A. Hoffman, 6,800 ft. from S line, 10,000 ft. from W line of most easterly NE cor. of 7,000-ac. ranch in La Trinidad Sur. .... T.D. 6,170 ft.; drlg.
Vacuum Oil Co.'s No. 1 Seeligson ..... Location, to spud in by Jan. 1; In southern part of county.

KENDALL COUNTY

Borgett et al's No. 1 W. Haag, 3,804 ft. from N line, 1,506 ft. from W line of W. Avery Sur. ..... T.D. 1,245 ft; S.D.



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Dixon Oil Co.'s No. 1 Ottmar Behr, 823 ft. from S and N lines of Jessie Wilson Sur., 3 miles S of Sisterdale ..... T.D. 2,708 ft.; standing.
Sitton et al's No. 1 Garvin, C of NE of D. L. Richardson Sur. in the D. L. Richardson Sur., 1 mile NE from Kendalia ..... T.D. 1,482 ft; S.D.
Fred S. Dibble's No. 1 Eliebrach, Sur. 77, N part of county ..... T.D. 50 ft; S.D.

KERR COUNTY

Evans & Gant's No. 1 Selker-Mears, C.C.S.D.&N.G.R.G. Sur. No. 1,605 ..... T.D. 4,031 ft.; abnd.
Evans & Gant's No. 1 E. Young, A. E. Burge Sur. No. 28 .. T.D. 1,312 ft; standing.
Evans & Gant's No. 2 Love, 150 ft. S and W line of Sur. 1,593 ..... T.D. 4,018 ft.; drlg.

KARNES COUNTY

V. F. Neuhaus' No. 1 Russell, 150 ft. to E line, 150 ft. N of Highway, in Carlos Martinez Sur. ..... T.D. 1,810 ft.; S.D.

LA SALLE COUNTY

Buckley Ranch O. & G. Co.'s No. 1 Buckley, 200 ft. from S line, 330 ft. from W line of Sur. No. 37 ..... T.D. 4,503 ft.; contract depth.

LIVE OAK COUNTY

J. A. Harper's No. 1 fee, 2,130 ft. to N line, 510 ft. to E line of farm, J. Pointevant Sur. No. 37 ..... Derrick up; moving in machinery.
Henderson Coquat's No. 1 Hewitt ..... T.D. 400 ft; standing.
V. G. Schimmel's No. 1 Terrell in Mark Killely Sur. ..... 950 ft.; drlg.
Phillips Petroleum and Henderson Coquat's No. 1 Sanger, 150 ft. to most S of N lines, 2,000 ft. to W line of tract ..... T.D. 900 ft.; drlg.

LEE COUNTY

A. H. Wheeler and associates' No. 1 fee, Blk. 47, H. Donohue Sur. ..... T.D. 3,390 ft.; drlg.
C. B. Polk et al's No. 1 Stolts, Hiram Donohue Sur. ..... T.D. 2,300 ft; S.D.
Chadwick et al's No. 1 Hickey, 1,000 ft to NW line, 300 ft. to NE line of farm in Warrelman Sur. ..... T. D. 20 ft.; spudded in.

MAVERICK COUNTY

I. N. Boicourt's No. 1 Bandera, School Land ..... T.D. 2,284 ft; standing.

McMULLEN COUNTY

Jacob Buzzini & Pickett's No. 1 Jacob in NE part of county ..... T.D. 200 ft.; drlg.

MEDINA COUNTY

Frank A. Brown's No. 1 Fohn, 150 ft. from E line, 790 ft. from N line of J. F. Torry Sur. No. 113 ..... T.D. 923 ft; twisted off drill stem. fishing.
Genard Bros.' No. 1 L. Crawford, 150 ft. to N and W lines of tr. in J. Keppler Sur. No. 478 ..... T.D. 2,240 ft.; S.D.
J. H. Hickey's No. 1 Jungman at N end Chicon Lake ... T.D. 650 ft; S.D.
Star Pet. Co.'s No. 1 Medina Valley Irrigation Co., 150 ft. from S and E lines of Isom Palmer Sur. No. 20 .... T.D. 525 ft; S.D.
C. J. Webster Oil & Gas Co.'s No. 1 Adams, 2,460 ft. to N line, 160 ft. to E line of Jos. Hillemeyer's No. 25 .. Derrick up. M.I.M.

MILAM COUNTY

Dil-Tex Oil Corp.'s No. 1 E. Lawson, 560 ft. from NE and 270 ft. from SE lines of farm in Fernando Rodrigues Sur., near Cause ..... T. D. 2,550 ft.; standing.
H. W. Elliott's No. 1 Marek, 767 ft. from N line, 500 ft. from W line of 160-ac. tr. in B. Wickson Sur. ..... T.D. 1,456 ft.; S.D.
Nowlen's No. 1 Beard, 1,350 ft. from SE line, 450 ft. from SW line of farm, in J. F. Guthrie Sur., 4 miles S Thorndale ..... T.D. 2,036 ft; S.D.
Red Bank Oil Co.'s No. 2-A J. A. Foster, 5,343 ft. to SW line, 180 ft. to NW line of farm ..... Spudded in.

NUECES COUNTY

Southern Crude Oil Pur. Co.'s No. 1 Chas. E. Stratton, 1,650 ft. E line, 330 ft. S line of P. Sancho Sur. .... T.D. 4,790 ft.; drlg.

REAL COUNTY

McGinley Corp.'s No. 1 Haby, C of SW, Sec. 175 ..... T.D. 2,530 ft; S.D.

STARR COUNTY

Jess Williams' No. 1 Welsh, 1,120 ft. to W line, 1,500 ft. to N line of tract, Pedernal grant ..... Location.

TRAVIS COUNTY

C. R. Franklin et al's No. 1 J. Wilson, 160 ft. from N and W lines of farm in A. Alexander Sur. ..... T.D. 1,154 ft.; drlg.
Ray & Henze's No. 1 Hatech, in C of tr. in S. Hamilton Sur. ..... T.D. 540 ft.; drlg.
Waldron et al's No. 1 T. Cook, 900 ft. from NW line, 3,500 ft. from SW line of D. H. Minor Sur. ..... T.D. 1,420 ft.; drlg.

WEBB COUNTY

O. W. Killam's No. 2 Reiser, 1,210 ft. to W line, 150 ft. to N line, Sur. No. 1,618 ..... T.D. 1,930 ft.; drlg.
O. W. Killam's No. 1 Bruni, 1,667 ft. to N line, 805 ft. to W line of Sur. No. 445 ..... Location.
Power & Dettenhaim's No. 1 Cowan & Goss, 1,870 ft. from W line, 1,656 ft. from N line of Sur. No. 1,606.. T.D. 150 ft.; no report.
Winfield Killam's No. 1 Killam, Blk. 18, Sur. 1,618, near Reiser ..... T.D. 2,050 ft.; abnd.
Cole Pet. Co.'s No. 4 Benavides, 2,480 ft. to E line, 160 ft. to S line of Sur. No. 1,613 ..... T.D. 4,050 ft; S.D.
Fansler, Johnson & Peacock's No. 1 Laurel, 425 ft. to N line, 600 ft. to E line of Blk. 10, Sur. 271 ..... T.D. 100 ft.; drlg.

WILLIAMSON COUNTY

Burns et al's No. 1 Wilder, 1,800 ft. to N line, 200 ft. to W line of tr. in H. Owens Sur. ..... T.D. 210 ft.; drlg.
Hays & Gee's No. 1 E. G. Johnson, 1,800 ft. from N line, 170 ft. from E line of tr. in B. C. Low Sur., S of Georgetown ..... T.D. 1,595 ft.; S.D.
McLean's No. 1 R. C. Miller, 300 ft. from S line, 150 ft. from W line of farm in Manlove Sur. ..... T. D. 1,700 ft.; shut down.
R. B. Wilson's No. 1 Speckles, 150 ft. N of road, 600 ft. from W line of farm in J. Jordan Sur., 1 mile N of Coupland ..... S.D. 875 ft.

WILSON COUNTY

A. M. Blume's No. 1 Nickolson, C. Diaz Sur ..... T. D. 1,600 ft.; shut down.

ZAPATA COUNTY

Ballard & Mercer's No. 1 Flores, 500 ft. from NE line, 550 ft. from SE line of Blk. 27, Porcion 37 ..... T.D. 350 ft.; drlg.
F. H. Etheridge's No. 1 Henne-Winch, in Sur. No. 286.. T.D. 1,900 ft; drlg.
T. H. Ward's No. 1 Uribe, 150 ft. NW line, 150 ft. SW line, Blk. 8 Subd., Share 7, Porcion No. 6, T. Uribe Partition of Jose V. Borrego Sur. ..... Rigged up and standing.
Bill Henry et al's No. 1 Gopher Trust estate, Borrego grant ..... T.D. 1,525 ft; standing.
J. M. Gier's No. 1 Garza Estate, 150 ft. to NW and SW lines, Blk. 18, C. A. Douglas Sub., M. Garza land in Comitas grant ..... Rigging up.
Lowe, Rogers et al's No. 3 Prudencia Benavides, 510 ft. to S line, 450 ft. to W line of Blk. 16, Sur. No. 11.. Rigging up.
National Oil Co.'s No. 1 Zapata Trust estate, 617 ft. NW line, 98 ft. NE line, Blk. 97, De Prom Subd., Porcion 6 ..... T.D. 600 ft; standing.
National Oil Co.'s No. 2 Adams, 150 ft. from NW line and SW line, Blk. 11, Borrego grant ..... T.D. 1,320 ft; standing.
Winch & Billings' No. 2 Bustamente, 852 ft. to NE line, 150 ft. to SE line of Share 31, Pal-Mar tract, Share 35, Fansler Sub., Comitas grant ..... T.D. 1,473 ft.; W.O.C.
United Prod. Co.'s No. 10 Measles, 1,000 ft. to NE line, 1,650 ft to SE line of Sur. No. 207 ..... T.D. 1,000 ft.; drlg.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 37)

OSAGE COUNTY

Briggs & Smith's No. 1 Wood, SE NW, Sec. 31-14-15.... S.D. 2,058 ft.

RAWLINS COUNTY

J. G. Durham et al's No. 1 Weaver, SE cor., Sec. 3-2-35w.. S.D. 3,925 ft.

RICE COUNTY

Cress et al's No. 1 Sharp, SE NE, Sec. 13-20-10w ..... Show oil 3,107-15 ft.; Siliceous L. 330-36 ft.; estimated 1,500 bbls.; shut in.

RUSH COUNTY

Dewey & Mitchell's No. 1 Greenawalt, C SW, Sec. 17-19-16w ..... Show of oil in Conglomerate 3,815-80 ft.; plugged back to 3,825-40 ft.; estimated 150 bbls.; S.D.

RUSSELL COUNTY

Agate O. & G. Co.'s No. 1 Rochfellow, SE cor., Sec. 6-13-12w ..... T.D. 3,657 ft.; abandoned.

SALINE COUNTY

Twin Mounds Oil Co.'s No. 1 Weis, C W½ NE NW, Sec. 20-13-4w ..... Drlg. 2,710 ft. by casing.

SHERIDAN COUNTY

Flo et al's No. 1 Shoemaker, SE SW, Sec. 27-7-26w ... S.D. 3,495 ft.

STAFFORD COUNTY

Rosenthal, Stanolind and Amerada's No. 1 Gray, C NE, Sec. 11-24-31w ..... S.D. 3,560 ft.

STEVENS COUNTY

Argus Prod.'s No. 2 Christopher, C NE, Sec. 10-33-39w... S.D. 5,521 ft.

SUMNER COUNTY

Tighe et al's No. 1 Thieson, C NW SE SE, Sec. 22-34-2.... S.D. 2,550 ft.
Trees Oil Co. and Shell's No. 1 Springate, NE SE SW, Sec. 6-34-2 ..... S.D. 2,300 ft.
Spencer et al's No. 1 Penwell, NW SE NE, Sec. 16-3-3... Drlg. 4,105 ft.

WASHINGTON COUNTY

Sincox et al's No. 1 Penwell, NW SE NE, Sec. 16-3-3.... S.D. 1,720 ft.

GULF COAST FIELDS AND WILDCATS

(Continued from Page 40)

The Texas Company's No. 46 Stevenson fee, 1,630 ft. N and 1,690 ft. W of SE cor. of J. B. Stevenson Sur.... Drlg. sticky shale and lime 3,360 ft.

PORT NECHES—ORANGE COUNTY

The Texas Company's No. 1 Polk-Kuhn-Glass, 260 ft. E and 1,545 ft. S of SW cor. Marshall Beaucham Sur., in the T. J. Notgrass Sur. ..... Drlg. shale 3,386 ft.
The Texas Company's No. 2 Kuhn, 587 ft. S and 150 ft. W of NE cor. of the Mary E. Hall Sur. No. 2 .... Location.

BIG CREEK—FORT BEND COUNTY

Gulf Prod. Co.'s No. 62 Davis, M. Young Sur., 400 ft. NE of No. 19 and 600 ft. SE of No. 57 ..... Spudded.

HULL—LIBERTY COUNTY

Daisetta and Liberty Oil Co.'s No. 1 Bashara (W.O.)..... Cutting and pulling screen to deepen 3,880 ft.
Republic Prod. Co.'s No. 144 Dolbear, Jesse DeVore Sur., 250 ft. W of No. 97 and 200 ft. SW of No. 99..... Total depth 1,852 ft.; shot stuck drill stem and cleaned hole; cmtd. 6⅝-in. csg. 1,218 ft.
Weneedan Oil Co.'s No. 2 Palmer, Chas. Underton Sur. .. Rigging up to pump 2,225 ft.
Sun Oil Co.'s No. 10 Carr ..... Shale showing oil 1,918 ft.; cmtd. 6⅝-in. csg.

PIERCE JUNCTION—HARRIS COUNTY

Gulf Prod. Co.'s No. 33 Taylor, James Hamilton Sur. No. 52, 300 ft. E of No. 32 and 50 ft. from S line ..... Set 2 joints 6⅝-in. screen 2,836 ft. with full string 6⅝-in. liner to top; comp. flowing 850 bbls. pipe line oil through 19/64 and 25/64-in. chokes.
Rio Bravo Oil Co.'s No. 18-A Settegast, J. Kopman Sur. (W.O.) ..... Rig up to deepen 4,512 ft.
Southern Pet. Co.'s (Tilton et al) No. 1 N. C. Barnes, B.B.B.&C. Sur. No. 1,028, 15 ft. from N line and 25 ft. from W line of Blk. 49, Jones Subd. ..... No report.

BLUE RIDGE—FORT BEND COUNTY

Coronado Oil Co.'s No. 2 Blakely, 430 ft. W, 575 ft. N of SE cor. of Lot 8, Blk. D, E. Drew Sur. ..... No report.

HIGH ISLAND—GALVESTON COUNTY

Yount Lee Oil Co.'s No. 20 Cade, N. Fitzsimmons Sur., 161 ft. W of No. 15 and 146 ft. SW of No. 17 ..... Shut down 60 ft.
Yount Lee Oil Co.'s No. 23 Cade, N. Fitzsimmons Sur., 300 ft. S of No. 22 ..... Drlg. hard sand and lime 5,020 ft.
Yount Lee Oil Co.'s No. 24 Cade, 1,010 ft. from NE line and 1,250 ft. from NW line of N. Fitzsimmons Sur. .. Drlg. 800 ft.

DAMON MOUND—BRAZORIA COUNTY

Intercoastal Oil Co.'s No. 6 Wisdom (D.D.), A. Darst Sur., Blk. 51, 2,550 ft. from NE line and 1,150 ft. from NW line of 840-acre tract ..... Drlg. shale and lime 3,200 ft.
Intercoastal Oil Co.'s No. 8 Wisdom, 155 ft. from NW line and 150 ft. from NE line, Lot 52, Blk. D, Wisdom Subd., A. Darst Sur. ..... Sand showing oil 3,554-89 ft.; cmtd. 8¼-in. csg. 3,530 ft.
The Texas Company's No. 1 Cave heirs, 75 ft. SW, 150 ft. SE at right angles from N cor. of Lot A, Blk. 73, Wisdom Subd., A. Darst League ..... Spudded.

ORCHARD—FORT BEND COUNTY

Gulf Production Co.'s No. 31 Moore, Mark Smith Sur., west of No. 29 ..... Location.

ORANGE—ORANGE COUNTY

Jefferson Prod. Co.'s No. 1 Bland ..... Sandy shale 2,980 ft.; drill stem stuck.

LOCKWOOD—FORT BEND COUNTY

Cullen & West and Gulf Prod. Co.'s No. 2-A Lockwood & Sharp, J. Rabb Sur., 600 ft. E of No. 2-A ... Set 132 ft. of 4½-in. screen, 29[illegible] ft. of blank and 4,711 ft. tubing; 5,158 ft.; comp. flowing 140 bbls. pipe line oil per hour, ¾-in. choke; tubing pressure 390 lbs.
Cullen & West and Gulf Prod. Co.'s No. 4-A Lockwood & Sharp, J. Rabb Sur., 550 ft. W of No. 2-A ..... Derrick.
Cullen & West and Gulf Prod. Co.'s No. 2 H. P. Lockwood, J. Rabb Sur., 300 ft. N and 900 ft. W out of SW cor. 383-acre tract ..... Drlg. hard lime and sand 4,184 ft.
Cullen & West and Gulf Prod. Co.'s No. 1 J. H. P. Davis, Robert Peebles Sur., 350 ft. S and 900 ft. E of SW cor. of A. P. George 619-acre tract ..... Drlg. gumbo and lime 2,263 ft.
Gulf Prod. Co.'s No. 1 Mary D. Booth Meyers, J. Rabb Sur., 800 ft. N of Cullen & West's No. 2-A Lockwood & Sharp ..... Drlg. rock 1,110 ft.

SARATOGA—HARDIN COUNTY

Rio Bravo Oil Co.'s No. 21-A Cotton ..... Comp. 10 bbls. 660 ft.
Rio Bravo Oil Co.'s No. 122-A Cotton ..... Spudded.

MARKHAM—MATAGORDA COUNTY

Deering & Newman's No. 1 Hawks (W.O.), W. H. Gayner Sur., 200 ft. from S line and 100 ft. from E line of tract ..... Rig up to deepen 4,150 ft.
Powers Prod. Co.'s No. 1 N. R. Meyers, Wm. Hadden Sur., 750 ft. from E line, 300 ft. from N line, Blk. 6.. Sand 3,361-76 ft.; 6⅝-in. csg. 3,352 ft.; set 25 ft. 10 in. of 4½-in. screen; comp. flowing 380 bbls. first 19½ hrs., ¼-in. choke, 29 gravity, temp. 60°, tubing pressure 400 lbs., csg. pressure 1[illegible] lbs.

LOST LAKE—CHAMBERS COUNTY

Pure Oil Co.'s No. 6 Lost Lake, 2,381 ft. W and 289 ft. S of No. 5 in Lost Lake ..... Drlg. sticky shale 5,560 ft.

MOSS BLUFF—LIBERTY AND CHAMBERS COUNTIES

Gulf Prod. Co.'s No. 4 McFaddin, J. McFaddin Sur..... Set 20 ft. of 4½-in. screen 6,04[illegible] ft.; tested salt water.
B. Manning's No. 1 Sergent, James McFaddin Sur., 50 ft. S and 450 ft. E of Texas Gulf Sulphur Co.'s No. 2 Sergent in Humble tract ..... No report.

REFUGIO—REFUGIO COUNTY

Larco Gas Co.'s No. 4 Strauch heirs, 150 ft. from N line and 150 ft. from W line, Lot 6, Blk. 2 ..... Drlg. rock 2,212 ft.
Mission Drilling Co.'s No. 3 J. J. O'Brien, Refugio town tract, 150 ft. from N line, 150 ft. from E line of 12½-acre tract ..... Drlg. shale 4,008 ft.
Moody Seagraves Prod. Co.'s No. 2-A St. John, Refugio town tract, 600 ft. E of No. 1-A and 300 ft. from N line of lease ..... Drlg. shale 5,253 ft.
United Prod. Corp.'s No. 2-A W. J. Fox, Wm. Hews and L. Brown Sur., 2,099 ft. NE along SE line from SE cor. of lease, thence 1,690 ft. NW at right angles ... Coring sand showing oil 5,864 ft.

SOUTH LOUISIANA FIELDS
LOCKPORT—CALCASIEU PARISH

Vacuum Oil Co.'s No. 32 Miller, 925 ft. E and 480 ft. S of NW cor. S half of NW of Sec. 9-10s-9w ..... Drlg. sandy shale 1,780 ft.

JENNINGS—ACADIA PARISH

Yount Lee Oil Co.'s No. 10 Housierre-Latrielle, 5,435 ft. E and 1,070 ft. N of SW cor., Sec. 47-9s-2w ..... Set 58 ft. of 5-in. screen 7,825 ft.; bailed dry; swabbing.

SORRENTO—ASCENSION PARISH

Gulf Ref. Co.'s No. 20 United Land Co., 4,040 ft. N and 760 ft. W SE cor. Sec. 15-10s-4e ..... Drlg. gumbo 3,927 ft.

HACKBERRY—CAMERON PARISH

Calcasieu Oil Co.'s No. 29 Watkins, 1,483 ft. W and 1,206 ft. N of SE cor. of Sec. 13-12s-10w ..... Drlg. gumbo 1,610 ft.
R. E. Seiss' No. 3 Vincent, 2,195 ft. S and 1,220 ft. W of NE cor. Sec. 30-12s-10w ..... Location.
R. E. Seiss' No. 2 J. M. Vincent ..... Shut down 2,162 ft.
J. G. Sutton's No. 3 Irwin, 1,520 ft. N and 1,395 ft. W of SE cor. of Sec. 13-12s-10w ..... Rig.
Yount Lee Oil Co.'s No. 44 State, 1,110 ft. N and 1,915 ft. W of SE cor. Sec. 13-12s-10w ..... Location.
Yount Lee Oil Co.'s No. 45 State, 1,220 ft. N and 810 ft. W of SE cor. Sec. 13-12s-10w ..... Location.
Yount Lee Oil Co.'s No. 46 State, 1,380 ft. N and 1,555 ft. W of SE cor. Sec. 13-12s-10w ..... Comp. flowing 675 bbls., 400 lbs. pressure, ⅝-in. choke, 2,990 ft.
Yount Lee Oil Co.'s No. 47 State, 1,420 ft. N and 1,408 ft. W of SE cor. Sec. 13-12s-10w ..... Spudded.

VINTON—CALCASIEU PARISH

Marrs McLean's No. 9 Gray (D.D.) ..... Coring sand 2,076 ft.
Vinton Pet. Co.'s No. 10 Gray (W.O.) ..... Sand showing oil 3,420 ft.; set 1 ft. of 3-in. screen; bailing.

SWEET LAKE—CAMERON PARISH

Pure Oil Co.'s No. 5 Sweet Lake (D.D.), Sec. 12-13s-8w.. Total depth 5,658 ft.; sidetracking hard sandy lime 5,276 ft.

MISCELLANEOUS WILDCATS
TEXAS
AUSTIN COUNTY

O'Hara Oil & Gas Co.'s No. 1 Neilous, J. C. Cummings Hacienda Sur., 650 ft. N of No. 1 Schroeder in 18-acre tract, north edge Mill Creek ..... Derrick.
Pomacal & Boletka's No. 1 Schebajsa, 329 ft. N, 78 deg. E of N. cor. B. Dottery Sur., near center of SW line of S. F. Austin 4 League on west fork of Mill Creek.. Rig.

BRAZORIA COUNTY

W. D. Southerland's No. 1 C. W. Chapman, Andrew Robinson Sur., 250 ft. N and 150 ft. W of SE cor. of Strip 2 ..... Rig.
The Texas Company's No. 2 Belcher, Harvey N. Little Sur., 1,728 ft. southeasterly from N cor. of S half of Sur., along NE line and thence 123 ft. at right angles ..... Rig.
United Oil Syndicate's No. 1 Levitt, 900 ft. from W line and 400 ft. from S line of John Peske Sur. ..... Total depth 1,594 ft. in gumbo; drill stem stuck.

BURLESON COUNTY

Marek & Son's No. 3 A. Marek, N. McFaddin Sur., 1,068 ft. N and 225 ft. W of SE cor. of tract ..... No report.
M. O. & T. Corp.'s No. 1 Rigers ..... No report.

FORT BEND COUNTY

Stone & Wyman's No. 1 Beard, H.&T.C. Sur. No. 118, 1,150 ft. from NW line and 1,892 ft. from NE line ... Shut down 1,275 ft.; 2 joints drill stem lost in hole.

GRIMES COUNTY

Rianjo Oil Co.'s No. 2 Cuthrell, Pat B. O'Connor Sur., C of 110-acre tract ..... Drlg. shale 3,250 ft.

HARRIS COUNTY

Givens & Daybault's No. 1 Lobit, David Middleton Sur., Blk. 19, Lobit Subd. ..... Drlg. sand and shale 2,560 ft.
Humble Oil & Ref. Co.'s No. 2 Irwin (D.D.), Mykawa, Wm. Lovett Sur. ..... Abandoned 6,401 ft.
Humble Oil & Ref. Co.'s No. 5 Minnetex, Mykawa, 150 ft. from S line and 200 ft. from W line, Lot 261, Wm. Lovett Sur. ..... Location.
Louisiana Oil & Dev. Co.'s No. 1 J. W. Wilson, W. Ritchie Sur. ..... Shut down 420 ft.
Shubert & Alexander's No. 1 Herman Hale, 1,058 varas E of NW cor. R. A. Hanks Sur., thence 790 varas S and thence 70 varas W 74 deg. ..... Drlg. sandy shale 2,403 ft.

JACKSON COUNTY

Chicago-Gulf Oil Co.'s No. 9 Drushell, Edna F. Rodriguez Sur., 1,080 ft. N, 58 deg. E No. 8 ..... Gas sand 2,640-44 ft.; cem. 6⅝-in. casing 2,640 ft.

JASPER COUNTY

Hext Drlg. Co.'s No. 1 Flourney, B. F. Jones Sur., 600 ft. NW of Helmerich & Payne's No. 1 Flourney .... Drlg. gumbo 2,210 ft.

JEFFERSON COUNTY

Humble Oil & Ref. Co.'s No. 1 Nelson, Wm. Rice Sur., 550 ft. from N line and 50 ft. from E line of W half of 1,071-acre tract ..... Drlg. shale 5,206 ft.
John I. Pipkin and Elam's No. 1 Broussard, McGaffey Sur., 800 ft. from S line in center E and W of 205-acre tract ..... Shut down in gumbo 500 ft.
Texas Gulf Sulphur Co.'s No. 1 Thompson, Fannett, Wm. Smith Sur., 1,950 ft. W and 1,600 ft. S of NE cor. of Thomas 446-acre tract ..... Sulphur test.
Texas Gulf Sulphur Co.'s No. 1 Thomas Fannett, Wm. Smith Sur., 1,950 ft. W, 1,600 ft. S of NE cor. of Thomas' 446-acre tract ..... Sulphur test.
Westbury Oil Co.'s No. 4 West, 450 ft. W and 4,210 ft. S of NE cor. of T. D. Yoakum Sur. ..... Shut down in gumbo 600 ft.

LIBERTY COUNTY

L. B. House's (I. R. Ingram) No. 1 C. T. Palmer, James Fenner Sur., 1,000 ft. from W line and 850 ft. from S line of tract ..... Drlg. sandy shale 3,526 ft.
Hamm et al's No. 1 Harvard, Day's Hill ..... Gumbo 1,015 ft.; shut down.

MATAGORDA COUNTY

United North & South Oil Co.'s No. 1 Stoddard, J. C. Keller Sur., 150 ft. W and 545 ft. N of SE cor. Blk. 53, Buckeye townsite ..... Shale 5,543 ft.; sidetracking junk 5,400 ft.
Harvey Smith's No. 1 Boker (Citrus Grove), J. V. Criswell Sur., Robbins Subd., 2,000 ft. S and 2,000 ft. E of NW cor. of Lot 14 and Lot 15 ..... Drlg. sandy shale 3,336 ft.

MONTGOMERY COUNTY

Pevehouse Oil Co.'s No. 1 Sealey, Jas. Pevehouse Sur., 1,575 ft. N of N line of Horton & Woodson's 1,562-acre tract and 2,226 ft. E of W line of E.&W. 1,870-acre tract ..... Drlg. shale 1,321 ft.
Humble Oil & Ref. Co.'s No. 1 W. A. Renn, 750 ft. from N line and 900 ft. from E line of S. J. McFarland Sur. ..... Drlg. shale 4,615 ft.
Strake et al's No. 1 South Texas Dev. Co., 468 ft. in westerly direction along N line of Theo. Slade Sur. from SW cor. of A. McGowan Sur., and thence 750 ft. in southerly direction at right angles from said line in Slade Sur. ..... Drlg. shale 4,886 ft.
Stanolind Oil & Gas Co.'s No. 1 R. M. Gary, Jacob Shannon Sur., 150 ft. SW of SW cor. D. Pitts 91-acre tract in R. M. Gary 633-acre tract ..... Location.

NEWTON COUNTY

R. T. Briscoe et al's No. 1 Joe Inman, approx. 1,900 ft. E and 500 ft. N of SW cor. of J. M. Scott Sur. ..... No report.

ORANGE COUNTY

Altex Oil Co.'s (Veteran Oil Co.) No. 1 Reed, A. Nelson Sur. No. 1, 500 ft. from N line and 250 ft. from E line of tract ..... Total depth 4,063 ft.; sidetracked 1,200-2,200 ft.; shut down.
Crew Oil Co.'s No. 1-A Mansfield, 50 ft. E of No. 1 ..... Shut down 2,060 ft.

POLK COUNTY

Freeman et al's No. 2 Freeman ..... Shut down 3,162 ft.
T. B. Hoffer's No. 1 Saner-Ragly Lbr. Co., 300 ft. out of most northerly cor. of most easterly County School Land Abst. 271 ..... Drlg. shale 1,620 ft.
Trans-Coastal Oil Co.'s No. 1 M. E. Roberts, J. F. Rumayor Sur., 350 ft. from W line and 150 ft. from N line of tract ..... Shut down 734 ft.

REFUGIO COUNTY

Blanco Creek Oil Co.'s No. 1 Damaan, 150 ft. from N line and 150 ft. from W line of Blk. 14, Bonnie View Ranch Subd. ..... Shut down 4,627 ft.
J. C. Dixon's No. 1 Peck, 450 ft. S, 150 ft. E of NW cor. of S half of Sec. 24, Bonnie View Ranch Subd., Estaban Lopez Sur. ..... Rig.
Humble Oil & Ref. Co.'s No. 1 O'Connor, John Keating Sur., 6,012 ft. S from NE cor. along SE line of Lon T. Ross Sur., thence 7,375 ft. W at right angles in John Keating Sur. ..... Drill stem test in shale 4,127-39 ft.; 300 ft. 24.4 gravity oil in 15 minutes, ⅝-in. choke; cored shale and streaks of sand showing oil to 4,155 ft.; fluid raised 800 ft. in 15 minutes; waiting casing.

SAN JACINTO COUNTY

E. P. Edwards' No. 1 J. R. Bennett, Cold Springs ..... Shut down 750 ft.

TRINITY COUNTY

Scientific Producers Co.'s No. 1 Thompson, I.&G.N. Sur. No. 47, 50 ft. out of NE cor. of H. K. Thompson 199-acre tract ..... Rig.

TYLER COUNTY

King Oil Co.'s No. 1 Caswell ..... Sand and shale showing oil 1,255 ft.; cem. 6-in. casing 1,218 ft.; standing.
Allied Pet. Co.'s (Texas Southern Pet. Co.) No. 3 Wilson, Mrs. E. Cherry Sur. No. 798, 1,500 varas from W line and 600 varas from N line ..... Fishing 5,025 ft.

VICTORIA COUNTY

Bunte et al's No. 1 Keeran, 3,714 ft. NE along railroad from SW line of Martin DeLeon Sur., and thence 1,600 ft. NW at right angles ..... Sand 3,661-68 ft.; to make drill stem test.
Houston Oil Co.'s No. 1 Conrad, T.&N.O. Sur. No. 1, 1,100 ft. from SW line and 100 ft. from NW line.... Heaving shale 5,225 ft.; cmtd. to 5,100 ft.; drlg. out cement.
The Texas Company's No. 3 McFaddin, S 15 deg. W 6,200 ft. and N 75 deg. W 1,850 ft. out of NE cor. John M. Rine Sur. ..... Coring shale 5,282 ft.

WALKER COUNTY

Hart Oil Co.'s No. 1 Thompson Lbr. Co., Jose Ortega Sur., 1,265 ft. S, 1,876 ft. W of SW cor. of J. B. Gibson's 71-acre tract ..... Drlg. sandy shale 840 ft.
McDaniel and associates' No. 1 Citizens State Bank, B.B.B.&C. Sur., C of 150-acre tract ..... Spudded.

WASHINGTON COUNTY

Moon & Yeager's No. 1 Hahn, 500 ft. from N line and 1,852 ft. from W line of J. H. Alcorn Sur., Abst. 3.. Drill stem stuck 3,635 ft.
Penn-Tex Oil Co.'s No. 2 Kamah Brenham, S. M. Williams Sur. ..... Lime and anhydrite 3,536 ft.

WHARTON COUNTY

W. H. Wallace et al's No. 1 Lee, 600 ft. S and 800 ft. W from NE cor. Sec. 18, G.H.&H. Sur. ..... Drlg. sticky shale 3,973 ft.

SOUTH LOUISIANA
ASCENSION PARISH

McElroy Pet. Co.'s No. 2 Lacey, 150 ft. S, 150 ft. W of NE cor. of Sec. 29-10s-4e ..... Drlg. sandy lime 4,512 ft.

CALCASIEU PARISH

Crawford Doyle's No. 1 Johnson, Sec. 23-9s-13w ..... Shut down 875 ft.
I. O. Davis' No. 1 Industrial, Sec. 29-9s-10w ..... Standing 6,568 ft.
Wilfred Lahay's No. 1 Jardell, Sec. 16-10s-12w ..... Shut down 3,650 ft.
Success Oil Co.'s No. 1 Hewitt, 90 ft. out of SW cor., Sec. 11-9s-11w ..... Rig.

EVANGELINE PARISH

Emile LeDeau's No. 1 Vidrine, 260 ft. W and 350 ft. S of NE cor. of Sec. 47-3s-2e ..... Derrick.

IBERIA PARISH

Jefferson Lake Oil Co.'s No. 25 Lake Pelgneur, Sec. 58-12s-5e, 400 ft. N of No. 24 ..... Sulphur test.

IBERVILLE PARISH

Standard Oil Co.'s No. 2 Myrtle Grove-Wilbert, Bayou Choctaw, 2,040 ft. N and 600 ft. W of C of Sec. 52-9s-11e ..... Building derrick.
Standard Oil Co.'s No. 2 Gay, Bayou Choctaw, 4,500 ft. N and 600 ft. E of SW cor. SE of Sec. 52-9s-11e .... Drlg. 250 ft.
Standard Oil Co.'s No. 6 Schwing, Bayou Blue, Sec. 73-9s-11e, 317 ft. S of No. 2 ..... Drlg. shale 6,010 ft.

LA FOURCHE PARISH

State Prod. Co.'s No. 1-B Stark, 1,921 ft. E and 1,540 ft. S of NW cor. of Sec. 71-15s-15e ..... Sulphur test.
The Texas Company's No. 3 La.L.&E., Leesville, 4,439 ft. S and 468 ft. E of NW cor. Sec. 26-21s-22e ..... Drlg. gumbo 986 ft.

PLAQUEMINES PARISH

Humble Oil & Ref. Co.'s No. 5 Cockrell-Moran, Lake Grand Ecaille, 10,377 ft. N and 2,614 ft. W of NE cor. of Twp. 21s-26e ..... Location.
Humble Oil & Ref. Co.'s No. 6 Cockrell-Moran, Lake Grand Ecaille, Twp. 21s-26e, 5,000 ft. E of Washington Sta. ..... Salt 1,574-1,613 ft.; abandoned.

TERREBONNE PARISH

La. Gas & Fuel Co.'s No. 2 Minor, 3,480 ft. S and 1,980 ft. E of NW cor. Sec. 3-18s-16e ..... Cored sand showing gas 3,878-82 ft.; drill stem test estimated 2,000,000 ft. dry gas; cmtd. csg.
The Texas Company's No. 2 La.L.&E., Bay Junop ..... Drlg. sandy shale and lime 5,571 ft.
The Texas Company's No. 4 La.L.&E., Bay Junop ..... Location.
The Texas Company's No. 5 State, Lake Pelto, 1,505 ft. N and 1,539 ft. W of SE cor. of Sec. 8-23s-18e..... Driving piling.
The Texas Company's No. 10 State, Lake Barre ..... Location.
The Texas Company's No. 11 State, Lake Barre ..... Oil sand 3,782-3,806 ft.; set 46 jts. 4½-in. screen; comp. flowing 1,250 bbls., 190 lbs. pressure, ½-in. choke.
The Texas Company's No. 12 State, Lake Barre ..... Location.
The Texas Company's No. 14 State, Lake Barre ..... Location.
The Texas Company's No. 1 La.L.&E., Lake Barre, 2,645 ft. S and 595 ft. E of NW cor. Sec. 20-21s-20e ..... Spudded.

VERMILLION PARISH

Pure Oil Co.'s No. 2 Southwest Louisiana Land Co., 1,300 ft. E and 300 ft. S of NW cor. Sec. 4-12s-1w ..... Sand and black shale 7,646 ft.; fishing swa'.

WEST FELICIANA PARISH

Putnam Syndicate's No. 2 Como Plantation, Sec. 51-1s-4w. Shale and lime 2,050 ft.; waiting on 8¼-in. casing.

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It doesn't pay to take chances with Manila Rope especially where there is a possibility that it may be used for exacting purposes—where life and limb and expensive equipment may be dependent on it.

Dry-Rot is to Manila Rope what rust is to wire lines only once started its deteriorating effect is more rapid and thorough.

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Tests we have made prove that the scientific treatment of all the fibres that go into "AMCO" "ALL-WEATHER" Best Pure Manila Rope make it truly Rot-Resistant—as nearly *Rotproof* as rope can be made. The treatment *does not add weight and is not greasy;* it stays on the fibre indefinitely. The float test proves that "AMCO" is as nearly *Waterproof* as rope can be made,—easy to handle in the worst weather.

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The GREEN marker yarn on the outside of one strand of the dark brown rope identifies AMCO "ALL-WEATHER" Manila.

COSTS SLIGHTLY MORE BUT IT'S WORTH IT

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 34)

Ault et al's No. 1 Hall, SE NW, Sec. 35-19-9 .....S.D. 200 ft.
Holden's No. 1 Phillips, SE cor., Sec. 3-9-18e .....S.D. 1,860 ft.
Marion Oil's No. 1 Sanders, NW NE NW, Sec. 10-9-18e..S.D. 2,387 ft.

KAY COUNTY

W. H. Atkinson et al's No. 1 Hayes, SE NE, Sec. 24-28-3..Rig.
Lewis et al's No. 1 Harris, SE NW, Sec. 14-25-1 .....Location.
Mummert Drgl. Co. et al's No. 1 Cormick, C NW SE, Sec. 9-27-2 .....S.D. 3,693 ft.
Blackwell Oil Co.'s No. 1 Harshman, Sec. 2-26-1w .....Rig on ground.

KIOWA COUNTY

Christian's No. 1 Jones, NE SE, Sec. 2-7-18w .....S.D. 820 ft.

LATIMER COUNTY

Choctaw Oil Co.'s No. 1 Fitzgerald, C NW NW, Sec. 1-6-22..Drlg. 150 ft.
P. English's No. 1 Unknown, NW SE, Sec. 16-6-19 .....S.D. 1,542 ft.

LINCOLN COUNTY

Hilton Phillip's No. 1 Phillips, SW NW, Sec. 2-14-3 ...Drlg. 4,120 ft.
Mote et al's No. 1 School Land, NW cor., Sec. 36-17-5 ..Drlg. 1,100 ft.

McINTOSH COUNTY

Patterson et al's No. 1 Smith, SW cor. NW SE, Sec. 32-9-16 .....Drlg. 5,813 ft.

MURRAY COUNTY

Capitol Prod. Co.'s No. 1 Cutchall, SE NE, Sec. 6-1-2 ....S.D. 2,425 ft.

MUSKOGEE COUNTY

Sioux Oil Co.'s No. 1 Unknown, NW SE, Sec. 21-11-19 ..S.D. 1,011 ft.

OKFUSKEE COUNTY

Shepard et al's No. 1 Neveas, SE NW SW, Sec. 3-12-10..S.D. 3,638-90 ft; Wilcox sand; hole full wtr.

OKLAHOMA COUNTY

Citizens Oil Co.'s No. 1 Sage Barber, NE cor., Sec. 21-11-3w .....S.D. 1,200 ft.
L. C. Hivick's No. 1 Sunset Addition, NW SW NW, Sec. 17-11-3w .....S.D. 5,515 ft.

PAWNEE COUNTY

Rookstool's No. 1 Wylie, NW NE SW, Sec. 6-20-5 .....S.D. 1,950 ft.
Cochran et al's No. 1 Green, NE cor. SW, Sec. 15-23-5..Rig.

PITTSBURG COUNTY

Tape Oil Co.'s No. 1 Fulton, SE, Sec. 34-7-14 .....S.D. 1,200 ft.
J. Morrison's No. 1 Fowler, NE SE, Sec. 13-7-17 .....Rig.
C. Kennedy's No. 1 Travis, C SW NE, Sec. 15-7-14 .....Rig.
C. Canady's No. 1 Jones, NW cor., Sec. 14-8-14 .....Rig.

ROGER MILLS COUNTY

Ute Oil Co.'s No. 1 Williams, C SW, Sec. 23-12-34w .....C.O. 5,150 ft.
L. C. Hivick's No. 1 Davis, C NW NE, Sec. 4-11-26w .....Drlg. 3,375 ft.

SEQUOYAH COUNTY

Braman Oil Co.'s No. 1 Unknown, C NW SW, Sec. 29-12-22 .....Drlg. 1,210 ft.

WASHITA COUNTY

Miley Pet. Co.'s No. 1 Wolfe, NE SW, Sec. 23-9-17w....Location.
Cooper & Terhune's No. 1 Blocker, NW cor., Sec. 29-8-19w .....Drlg. 2,685 ft.; show oil 2,459-67 ft.
Burns & Prince's No. 1 Deck, SW cor., Sec. 21-8-18 .....S.D. 1,140 ft.

OKLAHOMA PANHANDLE

TEXAS COUNTY

Three Way Oil Co.'s No. 1 Crane, SW NW, Sec. 11-1-1S..Cementing 4,685 ft.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Morris et al's No. 1 Mansell, SW NW NW, Sec. 9-2s-12 ..S.D. 285 ft.
Brookshire's No. 1 R. W. Rowland, NW NE SE, Sec. 18-3s-10 .....S.D. 1,530 ft.

BRYAN COUNTY

Bryan County Oil's No. 1 Childs, NW SE SW, Sec. 7-7-10..T.D. 650 ft.
Bush et al's No. 1 Commerce Trust, NE cor., Sec. 35-6s-9 .....T.D. 740 ft; plugged back to 459-80 ft.

CHOCTAW COUNTY

Hobson Bros.' No. 1 McChristian, NW NE NE, Sec. 12-6s-19 .....S.D. 730 ft.

JEFFERSON COUNTY

Smith's No. 1 McCarty, SE NW NE, Sec. 18-4s-8w .....Location.

LOVE COUNTY

Van Vleck's No. 1 Sheldon, NE SE NW, Sec. 14-8s-24 ...Drlg. 1,139 ft.
Autrey et al's No. 2 Cross, CWL SE NE, Sec. 27-6s-2 ...Show oil and gas 970-72 ft. and 1,324-34 ft; S.D; T.D. 1,634 ft.

MARSHALL COUNTY

Everette et al's No. 1 Agres, SE NE, Sec. 14-7s-6 .....Drlg. 755 ft.
Summers-Sellers' No. 1 Beams, NE SW NE SW, Sec. 20-7s-5 .....Rig.
Dixson's No. 1 McDuffel, SW SE, Sec. 3-7s-6 .....Show oil 791-828 ft; T.D. 1,096 ft; plugging back to 828 ft; abnd: T.D. 1,105 ft.
Taliaferro et al's No. 1 fee, NW SE SE NW, Sec. 34-5s-5 .....Landing csg.; T.D. 580 ft.

McCURTAIN COUNTY

Stewart's No. 1 Patterson, C SE SE, Sec. 7-6s-24 ..... S.D. 756 ft.

PUSHMATAHA COUNTY

George's No. 1 Lane, NW SE, Sec. 32-3s-15.....S.D. 840 ft.
Whitehead et al's No. 1 Messer, SE SW SW, Sec. 35-3s-18 .....S.D. 200 ft.

STEPHENS COUNTY

Brown's No. 1 Hightower, SW SE NE, Sec. 15-3s-5w ....Sand 990-1,004 ft; S.O; S.D.

CENTRAL WEST FIELDS

(Continued from Page 49)

Schmahl, NW Section 34, Tobin Township.

Pike County—The Murphy Oil Co. abandoned No. 1 John W. Grimes, SW Section 14, Patoka Township. A. E. Davis is drilling on the George P. Frank land at the south edge of Petersburg, in Section 27. No. 1 Ben McCord, drilled by James E. Young in SE Section 23, Washington Township, was completed a dry hole. Charles E. Miller, trustee, is nearing the completion of a test on the George C. Morgan lease, SW Section 26, Washington Township. The Indiana Southwestern Gas & Utilities Corp. completed a dry hole at 1,630 feet in No. 1 John M. Peed, NE Section 32, Clay Township.

Pulaski County—A well drilled by J. C. Christensen on his farm 5 miles northwest of Medarysville is down over 100 feet.

Spencer County—I. A. Polhamus completed a 25-bbl. well in the Cypress sand in No. 2 William Grass, NE Section 11, Huff Township. On another William Grass farm Wayne Gale is down 600 feet in the first well. Hagedorn & Schlacter have started No. 1 Louis Heubschman, SE Section 35, Huff Township. No. 1 J. Heubschman, drilled by the same parties, was completed at 838 feet.

Sullivan County—The test drilled by O. A. Thayer on the Bedwell and Lucas farm, NE Section 21, Jefferson Township, was dry. C. W. Scott has started a sixth well on the C. L. Davis lease in Section 14, Turman Township.

Switzerland County—The test well being drilled by Clarence Carter on his lot in Vevay is down 425 feet, having struck water and a little gas at 65 pounds pressure.

Warrick County—No. 1 Henry Menke has been started by the Elberfeld Gas & Oil Co. in NW Section 28, Greer Township.

ILLINOIS

Only one completion was reported from the Illinois fields, being H. R. Edeburn's No. 9, 200 feet from the north line and 2,600 feet from the east line of the A. E. Joseph farm, SW Section 23, Prairie Township, Crawford County, which pumped 2 bbls. from a depth of 876 feet.

In Petty Township, Lawrence County,

the Ohio Oil Co. abandoned No. 3 C. S. Waggoner farm, NE Section 2; No. 2 D. P. Stoltz, No. 1 farm, SE same section; No. 1 W. W. Ealters farm, NW Section 17, and No. 2 Minnie Wright farm, SE Section 18.

The Dupo Field in Sugar Loaf Township, St. Clair County, in the western part of the state, southeast of East St. Louis, proved a short lived field, as many wells have been abandoned during the past few months. During the past week William McPeak and others abandoned Nos. 1, 2 and 3 on the William and Louisa Lindemann property, SE Section 21, Sugar Loaf Township. Ostus Pogue pulled out No. 1 Mabel Glazier, SE Section 21; H. A. Woodworth did the same with No. 1 John Lorentz lot and Hart & Woodworth abandoned No. 1 on another property owned by Mabel Glazier, same section. This makes 20 wells pulled out during the past two weeks. William J. Chapman abandoned No. 1 Vincent Krack, Section 21, and Thomas Whalen did likewise with No. 1 J. L. Baker property, same section.

KENTUCKY

Seven scattered completions were reported from various parts of Kentucky, 4 of which were oil producers with an initial of 84 bbls., 1 dry and 2 gas wells. The best of the new wells brought in was the Security Oil & Gas Co.'s No. 7 on the Dink Curry farm, which is reported with an initial of 50 bbls., and is the Sebree Field, in Webster County.

In Hancock County, James C. Ellis and others' No. 5 well, 300 feet from the north line and 600 feet from the west line of the E. P. Talley 105 acres, in the Haynesville Pool, came in a dry hole at a depth of 3?8 feet.

In Ohio County, Oliver Jenkins' test on the Louisville Land & Stock Co.'s farm rated good for 20 bbls. at a depth of 1,541 feet. H. L. Ogle and others' test on the I. T. Westfield farm, near Friendship, is a light producer with a production of 4 bbls. Johnson & Young's No. 1 Guy Rowan farm, rated at 1,500,000 feet of gas, which is an exceptionally good gas producer.

In Daviess County, near Colyer Station, S. H. Russell and others' test on the S. Tanner farm produced 10 bbls. the first 24 hours.

T. J. Evans and others struck a gas well on the Ingram farm, near Salt Lick, in Bath County, with 700,000 feet at a depth of 700 feet.

EASTERN FIELDS

(Continued from Page 45)

the A. T. Yoke farm in the Injun sand at 2,115 feet and has a fair gas well estimated good for 500,000 feet a day. In the same district, Creed Barker and others drilled a test on the Gay Wilson farm in the Injun sand at 2,066 feet and have a fair well. Also in Sheridan district, Roy Waggoner and others drilled a test on the Clay Chenowith farm to a depth of 2,037 feet, the Injun sand, and have a small producer. None of these three wells was shot.

In Lee district, L. L. Townsend and others completed a test on the Sylvester Brannon farm which also went to the Injun sand and a depth of 1,947 feet. It will make a small gas well natural. In the same district, Ed Hess and others completed a second test on the John Evans farm at 2,275 feet and in the Injun sand, which is showing for a small gas well natural. On the Joan Duskey farm in Lee district, F. F. McIntosh and others drilled a test through the Injun sand which proved to be a dry hole. In Washington district, the Eastern State Gas Co. completed a second test on the Lubana J. Jarvis farm which was halted in the Salt sand at 1,272 feet after a flow of gas from that formation. At the present it is being completed in that sand and is showing for a fair well natural. In Sherman district, Creed Barker and others drilled a test on the Sid A. Hathaway farm which was completed in the Injun sand and is estimated good for several hundred thousand feet a day.

In Boone County, Godfrey L. Cabot completed a gas well in his No. 50 on the Federal Coal Co. tract in Sherman district. It went to a depth of 2,407 feet which is shallow for this section. In Washington district of the same county, the Pond Fork Oil & Gas Co. drilled a test on the Cole and Crane lease No. 2. It proved to be a duster to a depth of 3,110 feet and will be abandoned.

In Mingo County, the United Fuel Gas Co. completed its No. 4,328 on the Central Trust Co. lease in Warfield district. It was drilled to a depth of 3,858 feet in the Shale and is showing for a small gas well. In Kanawha district, Fayette County, Godfrey L. Cabot drilled his second test on the Elkhorn Piney Coal Co. tract deeper to 2,823 feet and it still remains a small gas well.

Drilling in West Virginia

Keeping tab on the deepest drilling well in the East, the United Fuel Gas Co.'s No. 4,053, a test on the J. W. Hinzman farm in Curtis district, Roane County, has now reached the depth of 8,320 feet.

In Lincoln County there are still a couple of tests drilling. In Union district, the Hamlin Natural Gas Co. has its test on the Gloza Bragg farm down to 1,600 feet, but at present is fishing for part of the string. In the same district the Woodyal Gas Co. has reached 1,021 feet on the Charley Honaker farm. In Jefferson district, Pridemore and Adkins is drilling a second test on the M. Miller and R. Topper lease. It is down 830 feet. In the same section, the Conley Gas Co. has No. 4 on the William Adkins farm, a fairly productive lease, drilling at 2,150 feet. In Carrol district, the Laurel Gas Co., or the Kanawha Gas & Utilities Co., started drilling No. 2 on the Jane Miller farm deeper but lost the tools at 1,405 feet and is fishing. The Cambridge Gas Co. met the same misfortune in drilling deeper its second well on the A. M. Mullens farm in Jefferson district. At 1,771 feet it is fishing for tools. The Frank Yates test on his own property in Harts Creek district remains shut down at 1,810 feet.

In Wetzel County, Ray Hennen and others have a rig standing on the Jesse Parsons farm in Proctor district. The Manufacturers Light & Heat Co. has two rigs standing, both to drill deeper old wells. One, No. 1,572, is on the D. W. Stewart farm in Church district, and the other is on the W. P. Hubbard farm in Clay district and is No. 3,300. The Shamwell Oil & Gas Co. test on the W. J. Price farm in Grant district still remains shut down at 3,053 feet with the tools still in the hole. In Doddridge County the Yates Oil & Gas Co. has its test on the Le Mara McKinney farm in Grant district drilling at 1,825 feet.

In Mingo County the United Fuel Gas Co. has two wells drilling. In Warfield district, its No. 4,324 is down to 550 feet but having difficulty with a bad hole. In the same district its No. 4,331 on the Cotiga Development Co. is drilling at 1,285 feet. This company is now building a road to its No. 4,329 on the Central Trust Co. lease which is a new location. In Harvey district, the Ohio Southern Gas Co. has a rig standing on the Cowden and Workman lease, but as yet has not started spudding. In Hamilton district, Nichols County, the Hamilton Gas Co. has reached 2,255 feet in No. 33, a test on the Craig heirs farm.

In Boone County work has slowed up considerably. In Peytonia district, the Columbian Carbon Co. has its well on the Bull Creek Coal & Land Co. tract down to 875 feet. The Owens Bottle Co. has several rigs and tools ready for additional work. In Scott district it is ready to begin operations on the S. M. Wheeler farm, a second test, and also ready for No. 21 on the Cassingham and others farm. In Washington district, it is about in the sand in its No. 5 on the J. E. Powells and others lease, and has a rig and tools ready to start No. 13 on the Little Coal Land Co. tract. In Sherman district this company has a rig standing for No. 20 on the Peytonia Coal Land Co. lease and is ready with the tools to start No. 21 on the same tract.

In Sherman district, the Pure Oil Co. has but one well drilling on the Federal Coal Co. tract, No. 55, which has reached

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1,899 feet but has been slowed up on account of a bad hole. In the same district and on his lease on the Federal Coal Co. property, Godfrey L. Cabot has two wells drilling, his No. 49 has reached 2,250 feet and his No. 51 is down 2,483 feet. On the Central Trust Co. lease in the same district, his second test has reached 1,820 feet. In Kanawha County, Mr. Cabot is cleaning out his No. 23 on the Quincy Coal Co. lease preparatory to testing at 1,959 feet. This lease is in Cabin Creek district.

SOUTHWEST PENNSYLVANIA

Southwest Pennsylvania presented one small gas well and one dry hole during the week. The gas well was in Wayne Township, Greene County, and was the test of H. D. Freeland and others on the D. T. Freeland farm. It was drilled to a depth of 3,303 feet and in the Bayard sand in which sand the gas was found. In South Franklin Township, Washington County, Bungard & Co. drilled a second test on the R. C. Clark farm in the Salt sand to a depth of 1,150 feet. It was a dry hole.

Washington County is more active than for several months. In Amwell Township, Ray Orril & Co. are drilling on the G. E. Walker farm and have reached 1,400 feet. In Smith Township, William Dollemyer has his test on the Thomas Brown farm down to 1,066 feet. In Mount Pleasant Township, the Hickory Penn Gas Co. has a rig standing on the Henry Seik farm. In East Finley Township, the West Virginia Natural Gas Co. has a rig standing on the Susan Strout farm, and one for a test on the S. W. Strout farm.

In Adams Township, Butler County, W. I. Goettman has spudded in and started drilling on the J. C. McKinney farm.

CANADIAN FIELDS

(Continued from Page 44)

cific Oil Co.'s No. 2, LSD 10, Section 33-18-2w5, is reported standing cemented at 5,215 feet.

South Turner Valley

In the Mercury area, South Turner Valley, Hylo Oils' No. 1, LSD 12, Section 4-19-2w5, is deepening below 5,100 feet and about 200 feet off the Dalhousie sands. The test may get production in the Dalhousie but will be carried to the crude naphtha horizon in the lime. Light crude production around 100 bbls. a day from the Home sand is being swabbed while deepening.

In the same area, Miracle Oils' No. 2, LSD 16, Section 5-19-2w5, is standing at 5,558 feet, the Union Drilling Co. having completed its contract. Miracle Oils' No. 3, LSD 11, Section 4-19-2w5, is drilling below 4,875 feet. As soon as this well is completed, the outfit will be used to deepen No. 2 to the limestone.

Central Turner Valley

In the Central Turner Valley, McLeod Oil Co.'s No. 4, LSD 16, Section 1-20-3w5, is deepening in a hard gray lime horizon of the Madison below 5,358 feet. Regent Oil Co.'s No. 3, same LSD, being completed by W. E. McLeod and Hugh Walsh, is reported drilling around 3,500 feet.

South of the Okalta wells, Dome Oils' No. 2, LSD 16, Section 36-19-3w5, is reported at 450 feet in the limestone and preparing for a shot. Some light crude production was encountered above the lime and fair shows of wet gas in the lime itself.

Hudson's Bay Test

In the Keho Lake area, southern Alberta, Hudson's Bay Oil & Gas Co.'s No. 1 Keho, LSD 2, Section 17-11-22w4, developed a fishing job while drilling out cement at 4,920 feet. Cement was set to shut off a small water intrusion from the Sunburst sand after the test got a strong show of high-grade crude at the Ellis-Madison contact. As soon as the tools are cleared and the water shut off approved by the government inspector, the well will be drilled into production.

Border Fields

East of Coutts, Mayland Southern's No. 1, LSD 13, Section 4-1-9w4, is reported drilling below 2,502 feet after striking an additional gas flow, estimated 5,000,000 feet a day, in the top of the Sunburst at 2,590 feet. The gas flow from three main horizons at 1,890, 2,180 and 2,590 feet now aggregates close to 12,000,000 feet a day. The test will be drilled into the Sunburst in hope of getting oil. Location is on the Alberta end of the Reserve Dome. A test on the Montana end, a few miles south, is reported to have got oil some time ago in the Sunburst but spoiled the well by deepening into water.

On the Milk River structure, Commonwealth Petroleums' No. 1, LSD 9, Section 9-3-15w4, is reported deepening in the lower Devonian at 5,060 feet. Traces of heavy crude are still met in the lime, but no commercial production.

On the Fisher Creek structure, Cotton Belt Mines' No. 1, LSD 5, Section 21-21-4w5, is standing at 2,625 feet owing to caving and will clean out and run casing before going deeper. Some shows of oil and gas have been met around this depth.

New Saskatchewan Test

An important new wildcat test has been started in southern Saskatchewan by Blackfoot Oil & Gas Development Co. whose No. 1 in Township 13-20w2 spudded in recently. The location is near Wilcox, and about 42 miles south and 6 miles west of Regina. The company holds 20,000 acres of leases and the location was selected by their geologist, W. B. Fry. Geological investigation indicates a structure on which the Bearpaw shales outcrop, while the Belly River horizon is looked for around 850 feet. This is an oil and gas bearing horizon in the plains area of Alberta. A standard drilling outfit has been brought from Turner Valley for the test which started with 20-inch hole and will be carried to 3,500 feet if necessary. William Murphy is in charge of operations and it is planned to drill through the fall and winter, a well equipped winter camp being provided while a neighboring coulee was dammed to provide a 16-foot depth of water for drilling.

The test is being financed by Regina men, the company's office being in that city. Officers are: President, Ira H. Bowman; vice president, H. A. Rutherford; secretary-treasurer, W. B. Hooker; director, Colin Fraser. If gas is struck in commercial quantities, it is planned to pipe the production to Regina.

Manitoba Gas Test

In the Manitou district, southwestern Manitoba, Commonwealth Petroleum's No. 2, LSD 2, Section 26-2-9wPM, which recently resumed drilling, is reported making hole below 925 feet.

Engage in Salt Production

Shareholders of the Simpson Oil Co. at the annual meeting held recently at Simpson, Saskatchewan, decided to provide a plant to develop the salt production encountered in their No. 1 well drilled in Section 9-29-25w2. The necessary funds, approximately $35,000, will be raised by the shareholders. A pipe line may be laid to C.P.R. tracks and the plant erected and operated there instead of at the well. As soon as the salt plant is in operation, a second test higher on the structure will be started for oil, which was the objective of the first test. No. 1 well got shows of oil and gas at various horizons but drilled into the salt bed at 3,500 feet. Directors re-elected were: O. L. Etter, Imperial, Saskatchewan; B. M. Brewster, Regina; H. H. Collins, Watrous; R. H. Mills and Fred Elder, Simpson; with Mr. Etter as president. No. 2 test is expected to start drilling next spring.

Ontario Drilling

In the Oil Springs Field, Lambton County, Ontario, Sarnia Oil & Gas Co.'s deep test in Lot 18, Concession 2, Enniskillen Township, is reported drilling around 600 feet. The location is not far from the Oil Springs and Fairbanks gushers which, about 15 years ago, encountered big gas flows at depth. One of the big wells at that time was reputed to have an open flow of 29,000,000 feet a day, but when connected with the pipe line it failed to hold up very long. The well now drilling is planned to test the Trenton limestone.

In Raleigh Township, Kent County, Olga Oil & Gas Co.'s No. 4, Lot 18, Concession 9, is drilling around 600 feet.

In the Ekfrid Field, Middlesex County, Union Gas Co.'s No. 2 Ekfrid, Lot 10, Concession 6, Caradoc Township, is drilling around 1,585 feet. No gas has been yet encountered, though this is approximately the depth at which the Southern Ontario wells near Newbury, to the south and west, got their shows. Union's No. 3 Ekfrid, Lot 13, Concession 3, Ekfrid Township, is drilling around 300 feet.

Quebec Oil Regulations

The Quebec provincial government, in view of the prospective drilling in the St. Lawrence Valley, has passed an order in council to regulate oil and gas operations in the province.

KANSAS FIELDS

(Continued from Page 37)

Drilling Co.'s No. 1 Mattison, Lot 8, Block 44, Musgrove Addition, city of Winfield, Section 22-32-4, is drilling at 3,100 feet, being deepened from 2,975 feet. Roth & Fautor's No. 1 Moyer, Lot 8, Block 45, Musgrove Addition, city of Winfield, Section 22-32-4, is drilling at 2,600 feet, being deepened from 2,307 feet. No. 1 Wilcoxon, Lot 3, Block 46, Musgrove Addition, city of Winfield, Section 22-32-4, an old well originally completed at 2,954 feet, is rigging up to drill deeper.

Ellis County

Davis Hazlett and others' No. 1 Weiland, NW cor. NE NE Section 1-13-16w, has been completed for 165 bbls. in sand 3,065-3,140 feet.

Greenwood County

Marcus and others' No. 1 Morris, NW cor. SE SW Section 5-24-12, is dry and abandoned at 1,835 feet. Polhamus and others' No. 3 Johnson, NE cor. Section 21-24-12, was shot with 60 quarts in sand 1,536-78 feet and completed for 25 bbls.

McPherson County

Youker and others' No. 1 Gratton, SE cor. SW SW Section 24-19-2w, Ritz-Canton area, is being deepened from 2,952 feet, is at a total depth of 2,963 feet where it is testing, being estimated at 600 to 800 bbls. Washoma Oil Co. and Shell Petroleum Corp.'s No. 1 Meeks, NW cor. NE SW Section 7-20-1w, has been deepened from 2,982 feet to 2,985 feet with no increase in oil and is now plugging back to 2,976 feet. The Texas Company's No. 1 Munn, NW cor. NE Section 12-20-2w, is rigging up to deepen from 2,982 feet. Youker and others' No. 1 Lagree, C SW NW Section 7-19-1w, is dry and abandoned at 3,448 feet in Viola lime topped at 3,442 feet. Abilene Oil Co. and Shell Petroleum Corp.'s No. 3 Anderson, SW cor. NW, Section 30-19-1w, has been completed for a potential of 1,537 bbls. in Viola lime 3,398-3,415 feet. Stearns & Streeter and Derby Oil Co.'s No. 1 R. Chinberg, SE cor. NW NW Section 15-19-2w, topped chat at 2,930 feet, drilled to 2,995 feet and has plugged back to 2,959 feet and completed for 4,500,000 feet of gas. Youker and others' No. 1 Eaton, NW cor. NE Section 26-19-2w, has been completed for 258 bbls. in chat 2,924-84 feet. Plains Oil Co. and Shell Petroleum Corp. and others' No. 2 Unruh, SW cor. NW NE Section 6-20-1w, made 956 bbls. in Viola lime 3,414-26 feet.

Phillips County

J. J. Holl and others made location for No. 1 Donaldson, C NE Section 25-5-18w.

Reno County

Shell Petroleum Corp. and Continental Oil Co.'s No. 1 Blake, SW cor. SE SE Section 23-23-4w, has been completed for 13,590,000 feet of gas after deepening from 3,308½ feet to 3,323½ feet. The well was originally completed for 10,000,000 feet of gas.

Rice County

L. E. Cress' No. 1 Sharpe, SE cor. NE Section 13-20-10w, which was shut in at total depth 3,338½ feet on April 8, 1931, without a test, is now preparing to test on the pump.

Rooks County

Seeley, Boyson and others made location for No. 1 Schneider, NW cor. SW SW Section 10-8-19w.

Russell County

Mid-West Exploration Co.'s No. 18 Brungardt, SW cor. NW NW Section 31-12-15w, is being deepened from 3,091 feet, now drilling at 3,110 feet. Signal Oil Co.'s No. 2 Rude, NW cor. SE SE Section 28-15-13w, is rigging up. Austin Oil Co. and others' No. 1 Rockefeller, SE cor. Section 6-13-12w, has been abandoned at 3,559 feet. The Texas Company's No. 1 Leonard, NW cor. Section 6-13-15w, an old well deepened to 3,087 feet, has plugged back 2 feet and completed for 5 bbls.

Sedgwick County

Gypsy Oil Co. moved material to the location for No. 5 Hamant, NE cor. SW NW Section 14-26-2. Fisher & Lauck's No. 6 Trustee, NE cor. NW SE Section 19-27-2, Eastborough Pool, is rigging up to deepen from 2,974 feet.

Stafford County

Mid-West Refining and others made location for No. 29 Allen, C SW SW Section 31-22-11w.

Wilson County

Fields & Cross moved a machine in for No. 1 Wilson, CNL NW SW Section 14-25-13.

RUMANIAN COMPANIES PLAN CONSOLIDATION

NEW YORK, Nov. 23.—A number of the leading independent Rumanian oil companies are negotiating for consolidation of operations, according to reports from Bucharest. The companies mentioned include Creditul Minier, the I.R.D.P., Petrolul Romanescu and Sondajul, with another company, yet unnamed, likewise involved. Outstanding capital of the four companies named aggregates 1,475,904,000 lei.

Consummation of the merger plans, it is expected, would result in a greater degree of stabilization in the Rumanian oil industry, and would tend to curtail the unrestricted production and price competition which has driven Rumanian oil prices to record low levels and has flooded Europe with cheap Rumanian refined products to the detriment of the world oil position in general.

NEW RUSSIAN RESOURCES

NEW YORK, Nov. 21.—Following a study of prospecting operations in the Maikop oil district in the North Caucasus, Soviet officials have estimated its resources at not less than 35,000,000 tons. Neftegorsk, near Krasnodar, in the North Caucasus, may become one of the largest oil centers in Russia, geologists' reports indicate.

SUMMARY OF STATEMENTS MADE NOVEMBER 10, 1931, RELATING TO BUSINESS OF VARIOUS PIPE LINES FOR MONTH ENDING OCTOBER 31, 1931

	Gross stocks	Runs from wells	Other receipts	Regular deliveries	Other deliveries
National Transit	673,029.18	154,511.51	807,303.28	582,367.42	542,969.57
S. W. Pa. P. L.	435,631.21	79,162.91	1,002,157.32	479,783.62	564,286.83
Eureka P. L.	1,162,617.18	321,800.33	361,547.34	364,263.27	598,443.12
Buckeye P. L. (M'ksb'g)	307,630.36	242,641.23	130,344.70	284,152.11	154,799.43
Bu'eye P.L. (Lima, etc.)	2,659,895.96	85,128.77	2,593,047.45	1,712,358.64	1,050,857.30
Buckeye P.L. (Cl'v'l'd)	36,248.81	12,576.97	123,132.89	1,712.38	137,287.56
Indiana P. L.	551,521.77	2,549.84	1,354,514.26	856,217.10	473,020.05
Cumberland P. L.	64,611.76	.....	.....	.....	.....
Southern P. L.	232,968.56	.....	213,898.43	69,625.59	126,142.77
Bradford Trans.	308,399.51	476,204.68	.....	559,039.81	.....
N. Y. Transit	99,292.01	36,518.13	144,974.49	191,559.68	.....
Northern P. L.	300,524.94	.....	464,987.32	168,179.98	295,366.63
Tide Water Pipe	1,015,782.02	23,220.70	.....	516,207.68	.....
Tuscarora Dev.	11,658.70	.....	.....	346,805.63	.....
Total October 31	7,860,823.37	1,474,314.17	7,285,807.38	6,122,162.91	3,952,173.31
Total September 30	8,007,375.88	1,518,482.29	7,423,071.02	6,303,372.00	4,489,906.19
Difference	146,552.51	44,168.13	137,263.64	181,210.09	537,732.82

Kansas Producers Suggest Wise Plan

Their Desire to Develop Ellsworth Arch Pools Under Best Modern Practices Should Meet With General Approval

By James McIntyre

When oil producers operating in the Ellsworth arch area of Barton, Ellsworth, Rice and Stafford Counties in Kansas petitioned the Kansas Public Service Commission for an order that drilling wells in that Silicious limestone area be confined to one well to each 40 acres, the purpose was to prevent waste of oil through water intrusion, which the producers believe would result from intensive and closely spaced drilling.

The producers, taking into consideration the peculiar character of this oil-bearing rock, are of the opinion that one well will drain 40 acres as completely as four wells, and in addition, that the drilling of but one well to the 40 will tend to hold back the water in such manner that it will be a help to the production of oil, rather than a hindrance such as might be expected from a multiplied number of wells.

The area is a relatively new one in the oil industry. More than a score of oil-

ESTIMATED PROFIT OR LOSS BASED ON COST OF $140,000 FOR FOUR WELLS TO EACH 40-ACRE TRACT AND USING VARIOUS SELLING PRICES, LIFTING COST OF 20 CENTS PER BARREL AND WITH ESTIMATED RECOVERY PER ACRE OF 6,000, 8,000 AND 10,000 BARRELS

				Cost of four wells at $35,000 each	Estimated profit based on 100% recovery	Less interest at 6% on $35,000 —8 years	Estimated profit based on 100% recovery and after deducting interest at 6% on $140,000 for 8 years.
Net recovery for 40-acre tract based on gross recovery of 6,000 bbls. per acre and after deducting one-eighth royalty (bbls.)			210,000				
Profit per barrel at:							
Selling price	Lifting cost	Profit					
$ .70	$ .20	$ .50	$105,000	$140,000	*$ 35,000	*$ 67,200	*$102,200
1.00	.20	.80	168,000	140,000	28,000	67,200	*39,200
1.25	.20	1.05	220,500	140,000	80,500	67,200	13.300
1.50	.20	1.30	273,000	140,000	133,000	67,200	65,800
1.75	.20	1.55	325,500	140,000	185,500	67,200	118,300
2.00	.20	1.80	378,000	140,000	238,000	67,200	170,800
Net recovery for 40-acre tract based on gross recovery of 8,000 bbls. per acre and after deducting one-eighth royalty (bbls.)			280,000				
Profit per barrel at:							
Selling price	Lifting cost	Profit					
$ .70	$ .20	$ .50	$140,000	$140,000	.....	$ 67,200	*$ 67,200
1.00	.20	.80	224,000	140,000	$ 84,000	67,200	16,800
1.25	.20	1.05	294,000	140,000	154,000	67,200	86,800
1.50	.20	1.30	364,000	140,000	224,000	67,200	156,800
1.75	.20	1.55	434,000	140,000	294,000	67,200	226,800
2.00	.20	1.80	504,000	140,000	364,000	67,200	296,800
Net recovery for 40-acre tract based on gross recovery of 10,000 bbls. per acre and after deducting one-eighth royalty (bbls.)			350,000				
Profit per barrel at:							
Selling price	Lifting cost	Profit					
$ .70	$ .20	$ .50	$175,000	$140,000	$ 35,000	$ 67,200	*$ 32,200
1.00	.20	.80	280,000	140,000	140,000	67,200	72,800
1.25	.20	1.05	367,500	140,000	227,500	67,200	160,300
1.50	.20	1.30	455,000	140,000	315,000	67,200	247,800
1.75	.20	1.55	542,500	140,000	402,500	67,200	335,300
2.00	.20	1.80	630,000	140,000	490,000	67,200	422,800

*Indicates amount of loss.

ESTIMATED PROFIT BASED ON COST OF $35,000 FOR ONE WELL TO EACH 40-ACRE TRACT AND USING VARIOUS SELLING PRICES, LIFTING COST OF 15 CENTS PER BARREL AND WITH ESTIMATED RECOVERY OF 6,000, 8,000 AND 10,000 BARRELS PER ACRE

				Cost of one well $35,000	Estimated profit based on 100% recovery	Less interest at 6% on $35,000, 12 years	Est'd profit based on 100% recovery and after deducting interest at 6% —$35,000, 12 yrs.	Deducting interest at 6%, $35,000, 12 years Estimated profit with production reduced 10%	20%	30%
			Barrels							
Recovery per acre			6,000							
Less one-eighth royalty			750							
Net recovery per acre			5,250							
Net recovery for 40 acres			210,000					189,000	168,000	147,000
Profit per barrel at:										
Selling price	Lifting cost	Profit								
$ .70	$ .15	$ .55	$115,500	$ 35,000	$ 80,500	$ 25,200	$ 55,300	$ 43,750	$ 32,200	$ 20,650
1.00	.15	.85	178,500	35,000	143.500	25,200	118,300	100,450	82,600	64,750
1.25	.15	1.10	231,000	35,000	196,000	25,200	170,800	147,700	124,600	101,500
1.50	.15	1.35	283,500	35,000	248.500	25,200	223,300	194,950	165,600	138,250
1.75	.15	1.60	336,000	35,000	301,000	25,200	275,800	242,200	208,600	175,000
2.00	.15	1.85	388,500	35,000	353,500	25,200	328,300	289,450	250,600	211,750
Net recovery for 40 acres based on gross recovery of 8,000 bbls. per acre and after deducting one-eighth royalty (bbls.)			280,000					252,000	224,000	196,000
Profit per barrel at:										
Selling price	Lifting cost	Profit								
$ .70	$ .15	$ .55	$154,000	$ 35,000	$119,000	$ 25,200	$ 93,800	$ 78,400	$ 63,000	$ 47,600
1.00	.15	.85	238,000	35,000	203,000	25,200	177,800	154,000	130,200	106,400
1.25	.15	1.10	308,000	35,000	273,000	25,200	247,800	217,000	186,200	155,400
1.50	.15	1.35	378,000	35,000	343,000	25,200	317,800	280,000	242,200	204,400
1.75	.15	1.60	448,000	35,000	413,000	25,200	387,800	343,000	298,200	253,400
2.00	.15	1.85	518,000	35,000	483,000	25,200	457,800	406,000	354,200	302,400
Net recovery for 40 acres based on gross recovery of 10,000 bbls. per acre and after deducting one-eighth royalty (bbls.)			350,000					315,000	280,000	245,000
Profit per barrel at:										
Selling price	Lifting cost	Profit								
$ .70	$ .15	$ .55	$192,500	$ 35,000	$157,500	$ 25,200	$132,300	$113,050	$ 93,800	$ 74,550
1.00	.15	.85	297,500	35,000	262,500	25,200	237,300	207,550	177,800	148,050
1.25	.15	1.10	385,000	35,000	350,000	25,200	324,800	286,300	247,800	209,300
1.50	.15	1.35	472,500	35,000	437,500	25,200	412,300	365,050	317,800	270,550
1.75	.15	1.60	560,000	35,000	525,000	25,200	499,800	443,800	387,800	331,800
2.00	.15	1.85	647,500	35,000	612,500	25,200	587,300	522,550	457,800	393,050

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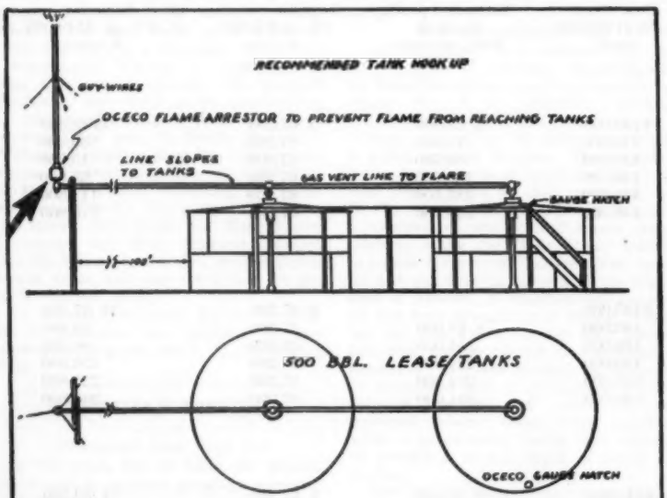
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producing wells have been drilled in 11 scattered pools in the four counties, but further drilling has been held back for various reasons, including the lack of shipping facilities.

Question of Waste

Producers, operating in the Ellsworth arch area, and most, if not all of them, familiar with Silicious lime production and its tendency to go to water quickly unless developed under the best of engineering practices, are desirous of getting all the oil possible of recovery out of their wells. If they do not they will be guilty of waste in various degrees.

If a producer, by proper methods, can recover 10,000 bbls. per acre and by improper methods can recover only 8,000 bbls. per acre, he is by improperly spacing wells and incorrect methods of producing, wasting the difference. The 2,000 bbls. is actually thrown away—dissipated through the formation and made altogether unrecoverable through water intrusion.

Among the companies interested as producers or lease owners in the big area are the Gypsy Oil Co., Empire Oil & Refining Co., Skelly Oil Co., The Texas Company, Prairie Oil & Gas Co., Carter Oil Co., Continental Oil Co., Shell Petroleum Corp., Phillips Petroleum Co., Atlantic Oil Producing Co., Sinclair Oil & Gas Co., Slick, Pryor and Lockhart, J. A. Aylward, Western Petroleum Co. and Darby Petroleum Co. All these companies and individuals are said to be in favor of the policy of drilling one well to 40 acres. The Public Service Commission of Kansas on November 3, pending a public hearing in the court house at Lyons, Rice County, on December 10, issued an order putting into effect the plan asked for by the producers. The commission's order in part read: "That for the protection of the oil-bearing strata and for the prevention of waste and underground waste in certain Silicious lime areas in and around the counties of Barton, Ellsworth, Rice and Stafford in the state of Kansas, all wells hereafter drilled in said areas shall be located in the center of a square 40-acre tract, that no other and further wells be drilled on any such 40 acres."

At the hearing in Lyons on December 10 all parties interested, including royalty owners, will be heard. It is not believed likely that there will be much, if any, opposition from royalty owners to the plan the producers have suggested.

Royalty Owners' Interest

The royalty owner's interest lies chiefly in what he can ultimately recover in dollars and cents. All he needs to convince himself that it will be best to develop the field scientifically and economically is to turn to the experiences of his royalty owning brothers in the East Texas Field where intensive overdrilling brought oil down to as low as 2½ cents per barrel and where 75,000,000 bbls. of oil was sold at an average of 32 cents per barrel.

The producers in their petition to the Public Service Commission say nothing of price. Their petition is based solely on waste of oil by overdrilling a formation the history of which has been that too much drilling hastens and increases water intrusion which forever shuts off oil from recovery by any means known. The royalty owners on the other hand are particularly interested in the amount of money they will receive from the production. Those among them that are familiar with the law of supply and demand as applied to spot demand of crude oil are more or less familiar with the following facts, while others who are not well posted on the oil business may get some practical idea of the results of too closely-spaced and too rapid drilling on a royalty owner's pocketbook.

Overdrilling and Low Prices

In the early days of the East Texas Field, when production was low, royalty owners received $1.04 per barrel for oil produced in that field. A tremendous campaign of drilling was even then going on in that territory. As wells were completed and production increased crude oil prices in the field fell rapidly until by March 1, 1931, they had dropped to 50 cents per barrel. On April 1 the average was about 45 cents; May 1, 38 cents; June 1, 31 cents; July 1, 17 cents. In July prices fell to 14 cents per barrel and in the week of August 12 to an average of 12 cents, the prices running from 5 cents upward. When the state clamped down on the field with martial law and supply fell to refinery demand posted prices of 68 cents were immediately made effective, and beginning with September 9 the producers and royalty owners averaged 67 cents per barrel for their oil. That is the average price prevailing now, most of the oil going out at the posted price. Had the state not put the lid on, East Texas oil would be selling at a nickel a barrel, which is the equal of the gathering charge, and Kansas oil would be selling at much below its present price. For the royalty owners to offer a protest against the petition of the producers would be to work to their own disadvantage, for they can be assured that it is to their interest as well as that of the producers that the treacherous Silicious lime area be conservatively handled. It may take longer to recover all the oil but the royalty owner as well as the producer will be the gainer from it in higher average price returns.

Notwithstanding the fact that the producers' petition for one well to 40 acres says nothing of price, and while the action of the Public Service Commission in granting the prayer of the petitioners ending the hearing on December 10, had nothing to do with price consideration, the question may be here considered from an economical standpoint without prejudice for or against the petition.

Interesting Tables

The accompanying tables are interesting to producers. One of them is based on the cost of $35,000 for one well to each 40-acre tract, using various selling prices, lifting costs of 15 cents per barrel and with estimated recovery of 6,000, 8,000 or 10,000 bbls. per acre. The other table shows the estimated profit (or loss) based on the cost of $140,000 for four wells to each 40-acre tract and using various selling prices, lifting costs of 20 cents per barrel, and with estimated recovery of 6,000, 8,000 or 10,000 bbls.

ROCKY MOUNTAIN AREA

(Continued from Page 45)

feet, with the tools in the hole and casing collapsed following destruction of rig by fire, is swabbing to reduce the fluid level so that fishing may be resumed. It had 2,500 feet of oil in the hole when swabbing began. Agitation caused it to slop over several times.

R. C. Tarrant's No. 1 Hogland, NW cor. SW Section 13-46-6w, is drilling at 2,350 feet in the base of the Colorado shale.

Fulton Petroleum Co.'s No. 1 Blackfeet, SW NE NE Section 28-36-12w, Milk River district, is drilling at 2,770 feet and progress continues to be slow.

Carbon County

Ohio Oil Co.'s No. 1 Chapman, C SW SW Section 2-7s-21, Dry Creek Dome, is drilling at 5,532 feet close to the objective Dakota. Same company's No. 2 Montana Industrial, C NW NE Section 11-7s-21, is rigging up, and its No. 2 Souders, C NE SW Section 2-7s-21, has cellar completed. Ohio's No. 1 Robinson, NW NE SE (cor.) Section 3-7s-21, has rig up.

Carbon Oil & Gas Co.'s No. 1 Armstrong, SW cor. NW Section 7-7s-22, Dry Creek, is drilling at 5,288 feet after setting casing at 5,111 feet. Both of the Frontier sands showed oil and gas in the cores and the next objective is the Dakota.

Ohio Oil Co.'s No. 1 Kuchinski, NW SE NE Section 15-7s-22, Golden Dome, has rig up. This structure is a little to the east and north of Dry Creek and in Township 22 instead of 21 as heretofore reported.

Corbet Royalty Co.'s No. 1, SW cor. SE Section 1-6s-23, Blue Creek district, an operation not heretofore reported, is drilling at 422 feet.

Jack Creek Oil Co.'s No. 1, CWL NE SE Section 15-7s-23, Jack Creek district,

an operation not heretofore reported, is drilling below 400 feet.

Cascade County

Charles Merz and others' No. 1 Sheffelt, CWL SE NW Section 4-21-4e, Black Horse Lake, is drilling below 450 feet.

Eden Oil Co.'s No. 1 Eden, SW cor. Section 27-18-4e, was abandoned at 1,325 feet.

Andover Oil Co.'s No. 1 Floweree, NW cor. SE Section 20-21-2w, Big Coulee, was abandoned at 2,175 feet where it had 1,200 feet of sulphur water in the hole.

Choteau County

Texas Pacific Coal & Oil Co.'s No. 1 Lehfelt, C NW SE Section 32-26-17, Big Sandy, was drilled to 50 feet as a validating hole and abandoned.

Custer County

Montana Bell Oil Co.'s No. 1, SW cor. NE Section 28-8n-45, Fort Keough district, was abandoned at 4,654 feet with the tools in the hole.

Daniels County

Whitetail Oil Co.'s No. 1, NW NE NW Section 10-36-50, Whitetail district, was abandoned at 1,467 feet.

Fergus County

Northern States Oil Co.'s No. 1 Woodward, SE cor. SW Section 20-14n-24, Button Butte, was abandoned at 2,040 feet. It started in the Quadrant and had the Mississippi lime as the objective. It had water sands at 1,260 and 1,340 feet.

Northwestern States Utilities Co.'s No. 1 Nelson, SW cor. NW Section 18-21-20, was abandoned at 850 feet. Same company's No. 1 Moore, NE SE Section 11-21-20, was abandoned at 1,350 feet.

Golden Valley County

Texas Pacific Coal & Oil Co.'s No. 1 Northern Pacific, SW cor. Section 21-8n-21, Woman's Pocket, was abandoned at 4,000 feet. This well was drilled with a rotary to get through heavy water pressure in a sand at 2,500 feet, the deepest formation tested up to that time. It succeeded in getting through the difficult horizon only to find water below.

Golden Valley Oil Co.'s No. 1, SW SE Section 26-6n-22, Belmont district, was abandoned at 2,040 feet.

Hill County

Montana Consolidated Gas Co.'s No. 2 Mangell, SW NE NW Section 32-34-14e, Brown's Coulee, was abandoned at 1,950 feet. This well was drilled to 1,650 feet by the Jones Oil Co.

A. H. McFarland's No. 1 Reg. Life Insurance, C SE SW Section 15-30-13e, was abandoned at 2,230 feet.

Judith Basin County

Newton-Waddingham's No. 1, SE NE SW Section 15-16n-10e, Wolfe Butte, was abandoned at 1,040 feet.

Liberty County

Sunburst Oil & Refining Co.'s No. 1 McLaren, C SE SE Section 9-37-6e, Pinhorn district, was abandoned at 3,115 feet.

Western Natural Gas Co.'s No. 1 Hicks, C NW NE Section 26-37-4e, Whitlash district, is spudding.

Northland Oil & Gas Co.'s No. 1 Yurman, C SE SW Section 32-33-5e, Liberty district, was abandoned at 3,720 feet. It was through the Madison lime at 3,610 feet.

Pondera County

Hiland-Van Daele's No. 1 Kendal, SE NE Section 35-30-3w, Conrad district, was dry and abandoned at 4,215 feet.

Rosebud County

Prairie Oil & Gas Co.'s No. 1, Contract 4, SE SW SW Section 28-11-39, Porcupine Dome, was abandoned at 1,360 feet. Its No. 1, Contract 3, Section 26-10-39, was abandoned at 2,600 feet, and its No. 1-XX, Contract 3, NE SW NW Section 26-10-39, was abandoned at 4,505 feet, 805 feet in the Madison lime.

Sheridan County

Cheyenne Oil & Gas Co.'s No. 1 Olsen, NE cor. NW Section 15-35-53, was abandoned at 1,680 feet and rig is down for its No. 1, SE cor. Section 14-35-53, which did not spud.

Toole County

In the Sunburst Field, Iatha-Idaho's No. 2 Newman, C NE NW Section 30-32-1w, is drilling below 300 feet.

Wagner-Mallernee-Trott's No. 1 Wright, SW SE SW Section 11-34-1w, was completed as a gas well at a total depth of 1,480 feet. It had 2,000,000 feet of gas per day in the Sunburst sand at 1,237-77 feet and oil in the Ellis at 1,476-80 feet. Same firm's No. 2 Wright, C NE SW Section 11-34-1w, is drilling at 1,000 feet.

Magic City Oil Co.'s No. 5 Burwash, NE SE Section 15-34-1w, was abandoned at 1,437 feet.

R. E. Craft and others' No. 1 Higgs, C SE NW Section 32-34-2w, is drilling at 900 feet.

Anaconda Petroleum Co.'s No. 1, SW cor. NE Section 19-36-2w, Barthelote district, was abandoned at 1,580 feet.

Valley County

Jones, Goer and others' No. 1, NW cor. Section 31-37-38, Opheim district, was abandoned at 1,115 feet.

WYOMING

Weston County

Chadron-Osage Oil Co.'s No. 15, NW cor. SW Section 14-46-64, Osage Field, is drilling at 900 feet.

Julius Peters and others' No. 1 Witzell, SE cor. NW Section 30-46-64, Fiddler Creek, is drilling at 3,300 feet and is reported to be on top of the Muddy sand.

Crook County

Northwest Oil & Gas Co.'s No. 1 Wolf, NW cor. Section 6-54-60, Oak Creek, is drilling at 1,585 feet in the Opeche sandstone 80 feet above the objective Minnelusa.

Niobrara County

Indian Petroleum Co.'s No. 1, NE NW NE Section 7-35-65, Lance Creek, recemented the 4¾-inch at 4,220 feet. It is reported to be on top of the objective Sundance sand.

Fremont County

Producers & Refiners Corp.'s No. 10, SE NW SW Section 14-32-95, Big Sand Draw, which was drilled with rotary to test horizons below the big gas in the Frontier and was the first of a number of tests started with that object in view which accomplished the purpose, has been completed as a gas well in the Morrison sand at 4,290-4,386 feet and gauged 65,000,000 feet per day. It was drilled to 5,345 feet and tested the Sundance and then was plugged back and redrilled to the Morrison. It opens a new producing horizon below the gas in the Frontier.

Kinney-Coastal Oil Co.'s No. 1 Chatterton-Weeks, C SW NE Section 22-3n-1w, Pilot Butte, was drilled 20 feet deeper to 3,651 feet, but failed to pick up any additional Muddy sand. It will be shot in an effort to increase production. This well at the time of completion a few weeks ago gauged 2,000,000 feet of gas with a pressure of 80 pounds. It gradually built up the pressure to 1,300 pounds.

Ward Oil & Gas Co.'s No. 1, NE cor. Section 28-34-90, Dutton Basin, which blew in as a gasser in one of the Wall Creek sands at 2,530 feet, only to bridge and shut off the flow, has installed control equipment and is cleaning out and fishing for tools. It will open a new gas field. Flow, before bridging, was estimated at 10,000,000 feet.

Lander Corp.'s No. 2, NW cor. NE Section 35-33-99, Bartram Gap, is drilling below 1,900 feet. It is testing horizons below the Embar.

Big Horn Oil Co.'s No. 1 Gabus, SW cor. Section 14-38-94, near Shoshoni, which has been shut down for some time at a shallow depth, is preparing to resume.

Washakie County

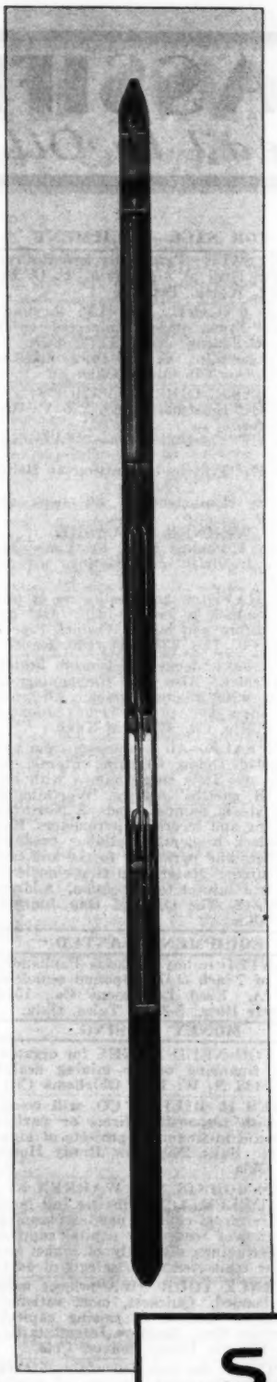
Ohio Oil Co.'s No. 1 Strothers, SW SE NW Section 19-45-92, Neiber Dome, is coring at 8,413 feet in the Muddy sand. The sand is dry and indications are that it will prove to be a disappointment in this sand as it did in the Frontier. It will continue on to the Dakota and possibly lower.

Bales Oil Trust's No. 1 Brome, NE NW Section 31-48-80, Hidden Dome, is drilling at 750 feet.

Park County

Midwest Refining Co.'s No. 24 Rosenberg, NE SE NE Section 26-58-98, Frannie Dome, produced 500 bbls. per day when put on the pump. It was completed in the Embar at 3,001 feet and extends the pool one-fourth of a mile to

(Continued on Page 81)



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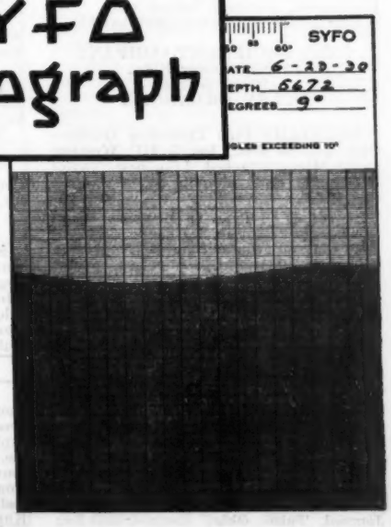

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Prepare for Higher Octane Ratings

Refiners Certain That It Will Be Necessary to Improve Regular Gasoline Grade. Tank Car Prices Lower

By Robert C. Conine

Chicago Bureau, The Oil and Gas Journal, 6 North Michigan Ave.

CHICAGO, Nov. 23.—Gasoline octane rating, for some time considered in Chicago district as a nettle given to jobbers for the harassment of marketers, and not infrequently as part of the automotive engineer's alibi for low engine efficiency, has been thrust by events of the past week into the forefront of all the refiners' and marketers' problems. In this district the action of Ethyl Gasoline Corp. in withdrawing its announcement that it would permit licensees to blend 1.5 c.c.s of tetraethyl lead compound with their regular grade of gasolines after March 1 of next year when the octane rating of the premium grade would be raised to 78, has had some possibly unforeseen effects.

Preparing for Eventualities

A majority of the refiners, in conversations with the writer, say that although they foresee the introduction of a "second grade Ethyl" in the near future they plan to continue their present work of expanding and adding cracking units, low temperature rerun stills, pressure distillate and natural gasoline debutanizers and stabilizers, refinery and cracking plant gas recovery installations, and other equipment necessary to the modern gasoline manufacturer.

It is a fact well known in Chicago district refining circles that one of the largest refiners operating in East Chicago is prepared to ship out gasoline, a straightrun and cracked material, of 70 octane number, when it is considered expedient to do so. It is also a fact that another important refiner is selling 72 octane number gasoline in the district as the regular grade, and two others are marketing 70 and 68 octane number gasoline, respectively, from their regular grade pumps. An interesting development in the premium grade of gasoline is brought out in the following table giving the characteristics of five Ethyl gasolines marketed last week by major interests:

	A	B	C	D	E
Oct. No.	74.8	76.6	74.8	75.6	75.0
Gravity	61.5	61.1	60.9	61.2	62.4
Initial	88	96	94	95	108
10 per cent	141	145	145	147	165
20 per cent	169	179	179	185	189
30 per cent	196	204	206	209	205
40 per cent	224	230	232	235	223
50 per cent	248	249	254	251	238
60 per cent	262	272	279	270	256
70 per cent	300	295	291	293	279
80 per cent	332	322	329	318	294
90 per cent	367	358	363	351	325
95 per cent	388	382	384	383	356
Endpoint	397	393	394	397	376
Recovery	97.2	97.3	97.1	97.1	98.0
Residue	1.2	1.2	1.1	1.2	1.2
Loss	1 6	1.5	1.8	1.7	0.8
Pct. over at					
140° F.	9.8	8.8	7.9	8.9	6.0
212° F.	35.8	33.5	32.5	31.2	34.0
221° F.	39.2	37.4	36.5	35.5	39.0
284° F.	64.3	64.3	62.2	67.0	77.1
392	all well within limits.				

A slight examination of this table will serve to throw light upon the contention of most of the refiners in Chicago district that the introduction of "second grade Ethyl" will take from the refiner the individuality he has built into his product and upon which he has spent considerable time and money in advertising. The white stocks for the Ethyl gasolines shown in the table, just as closely related obviously in respect to sulphur and gum content, do not express the individuality one would expect from the newspaper advertisement and posters.

The refiners, according to present indications, are determined to continue improvements at their plants to keep them abreast of advances made by their competitors and by the automobile manufacturers, and they are apparently agreed that it is to their best interests to retain complete control over the manufacture of the gasoline marketed as the regular grade. The question of stabilizing the antiknock rating of all competitive price gasolines is still far from solution, and while the arguments for a 65 octane number maximum for the regular grade are convincing enough, it is practically admitted on all sides in Chicago district that the majority of refiners will refuse to stop at 65 and will probably move on up to 68 and 70 octane number, if not 72 octane number as in one existing case.

Decree Higher Antiknock

The president of a leading automobile manufacturing company estimates that 2,000,000 automobiles will be bought in 1932, and that the feature of the 1932 automobile engine will be a higher compression ratio. Refiners looking beyond 1932, "when times will surely be better," may give thought to recently released figures which show that about 13,000,000 of the automobiles now in operation are at least five years old. High compression heads are now optional on Fords, Buicks and Hudsons, and it is said that other automotive factors where the higher compression head is optional have been improved to meet the requirements of higher compression.

The refiners, on their part, may look critically upon the achievements of the automotive engineers to see what they have done in the matter of design to prevent overheating fuel lines, vacuum tank, fuel pump, carbureter, etc.; what they have done to prevent condensation of water in cylinders and crankcase; elimination of hot spots to minimize detonation, and improvement of cylinder head design to minimize the difficulties that come with higher compression ratios; fuel-air ratio and spark advance control, etc.

Effect on Gasoline Markets

As predicted by refinery technologists when plant operators advanced from the stage of merely running off a crude oil cut classed as gasoline and treating it with special attention to color and odor, the changes which have come into the industry and made the refiner a first-class manufacturer instead of a skimmer must be reflected in the cost of operation and this cost must be passed on to the consumer.

When all of the refiners have to meet an elevated standard they must have better prices. The fact is also worth considering that refiners and would-be refiners will look beyond tomorrow in their operations before they jeopardize heavier investments in modern refineries by unsound marketing practices. There will be a very strong incentive for seeking and promoting stability in the industry and the irresponsibles will have to move on to new fields.

Market Sentiment Better

The entrance of a number of refiners into the gasoline markets as buyers has arrested, for the time at least, the softness which crept into the motor fuel price lists early this month, but not before prices had moved below last week's quotations. The natural gasoline markets have weakened also. Kerosene and fuel and gas oil markets are holding well in price, but the demand is considerably less than expected for this time of year. However, in Chicago district oil trade circles it is felt that the more important refiners and marketers, those who have a wider influence, are taking steps to keep business on an even keel and are working to counteract the effects of less foreseeing operators.

Contract Promises Stability

A new form of contract which is said to be offered to jobbers by a majority of the marketers in Chicago area promises to bring real stability into the business. The feature of this agreement is that it responds to changes in the spot market in such a way as to split the advantage between the refiner and the buyer. The buyer is given a range of 4.5 to 5.5 cents in which to "play the market" without sharing open market changes with the refiner. Below 4.5 cents and above 5.5 cents, as marginal guarantees, the difference between the contract price and the spot market price is split. Thus, taking 15 cents as the service station posting in Chicago and deducting state gasoline tax and freight from Group 3, we have 9.62 cents; when the spot market price in Tulsa is 6 cents the buyer, who under a 4.5-cent margin would pay 5.12 cents, is protected up to 5.5 cents and the additional cost of a 6-cent Tulsa spot market would be 0.06 cent. If the Tulsa open market price dropped to 3 cents, making the difference between the contract and spot market 2.12 cents, this difference would be split and the 5.12 price to the buyer would be cut to 3.93 cents. The effect would be to hold the two markets in closer relation and to prevent such erratic fluctuations in the open markets as have featured just recently.

Demand Starts Tapering

The time is practically upon us when the additional consideration to keep crude oil runs to stills down to a lower level will be the greatly slackened demand for gasoline due to the belated arrival of winter weather. If the demand had been what it was earlier in the month, the past week would probably not have seen the jobbers so well satisfied with their current stocks. In fact, it has required an abnormal demand to make any sort of spot market in the district because of the much greater appeal of the contract offers. There is little occasion now for jobbers to seek immediate shipment of material not available on the regular agreement which gives a marginal spread of 6 cents below the posted service station price. With the new contracts in force it is very likely that the whole marketing setup will be under closer control.

Need Pennsylvania Advance

Although the gasoline tank car markets in Pennsylvania refining centers has advanced from 4.27 to 4.75 cents, f.o.b., the price can rise to 5 cents and still permit Chicago distributors, or brokers, to handle this material in Michigan and Indiana at a nice profit. In fact, two cars of Pennsylvania gasoline came into Chicago Saturday at a Group 3 price of 3.5 cents. If the Pennsylvania gasoline tank car market advances to 5 cents material can be laid down at Fort Wayne, Ind., at 3.75 cents Group 3, and at Detroit at 3.21 cents Group 3.

Louisville Material

Louisville gasoline marketers are reported to be sold out for some time to come, and this is a cheering note due to the fact that this material has been moving to Indiana points at prices reported as low at 3.5 cents Group 3. With the East Texas and Mid-Continent refining points reported to be holding down their gasoline production in better relation to demand, and with the Pennsylvania influx weakening under steadily advancing tank car markets in that state, it is not difficult to understand the better feeling prevailing in Chicago district in spite of the fast waning motoring season.

It is quite possible that the gloomy, drizzly weather of the past week has led the marketers to jump to the conclusion that the motor fuel season is over. It is not altogether unlikely that the mild winter of last year will be repeated, and possibly bettered as was the fall. It is also to be remembered that heating systems for automobile coach interiors have been much improved, are cheaper in price and more generally advertized than in the past. While the introduction of such cold weather comforts will not make the difference that the appearance of the closed car did, it will certainly help.

Foreign Gasoline Season

The time is fast drawing near when navigation on the Great Lakes will cease until the arrival of warmer weather. The closing of the lakes to boats means, for one thing, the end of foreign gasoline importation. Unless the shipments of gasoline reported to be on the way from Rumania arrive soon, this imported material will have to find an outlet farther removed from this area. Some of the Chicago distributors have been attempting to negotiate with buyers of the Rumanian gasoline, but report that to date they have been unsuccessful. It is late in the season for planning to meet price conditions in Chicago district with this gasoline.

Factors which may come into play before the close of the month to bolster the gasoline markets are not discussed as much as before the meeting of the American Petroleum Institute here, November 10-12. It seems that all that can be said has been said, and all that remains is for action to be taken; this action being concerned principally with curtailment of crude oil production and runs to stills, the new contract for gasoline marketers, the controversy over increasing octane ratings of regular gasoline, and that matter of gasoline tax boosting and evasion of the tax.

Gasoline Tank Car Markets

At this time almost anything can happen in the refined products markets. True, the weakness in the gasoline tank car markets which for a time last week threatened to bring a repetition of several debacles this year has been counteracted by comparatively large scale buying on the part of refiners, but it is quite generally conceded that current prices, which are below last week's early quotations, are far from firm. The resellers and brokers are having difficulty in finding buyers who do not try to trim the price below cost. One broker got a price of 4 cents on a car of U. S. Motor of no octane specifications and when he sought to turn the material over for an eighth of a cent profit the buyer, at Minneapolis where the nominal market is 4¼ to 4⅜ cents, said he would not pay more than 3⅞ cents.

This situation is by no means general, as most of the gasoline is in good keeping, but there is enough of this more or less "distress" material to keep buyers in control of the markets. As pointed out before, the marketers are holding the refiners responsible for price developments this week. Figures released last week by the American Petroleum Institute show a decline of 180,000 bbls. in gasoline stocks for the country, and an increase of 343,000 bbls. in gasoline stocks for the country, and an increase of 343,000 bbls. in crude runs to stills. Production of cracked gasoline also mounted 29,000 bbls. for the week.

Antiknock Material

While the tank car gasoline markets where there is no octane number specifications are lower in price, antiknock material continues to bring a premium

(Continued on Page 80)

East Coast to Get Rumanian Gasoline

7,500-Ton Cargo Scheduled for Shipment From Constanza This Month. Retail Gasoline Prices Advance. Kerosene Demand Improves

By A. E. Mockler

New York Bureau, The Oil and Gas Journal, Rooms 1919-21, No. 154 Nassau Street

NEW YORK, Nov. 23.—Invasion of East Coast gasoline markets by Rumanian gasoline is looked for shortly, a shipment of approximately 7,500 tons being scheduled for shipment from Constanza to a United States Atlantic Coast port, north of Hatteras, this month. Rumanian gasoline is now being marketed in the Detroit area, and one or more additional cargoes is now afloat for that city, via Montreal, but the East Coast area has yet to receive its first shipment. While the cargo in question is booked for an East Coast port, there is an outside possibility that the tanker may be rerouted. Several weeks ago a tanker was chartered to carry Rumanian gasoline to a North Atlantic United States port or Detroit, but the latest fixture specifies only North Atlantic ports.

A small shipment of Russian gasoline came into Baltimore last year, but met with such a cool reception on the part of the trade that the experiment was not repeated by the Soviet oil trust. It is not yet known who will handle the Rumanian gasoline destined for the East, although it is considered possible that the consignment may come to an independent operator active in the New York area.

Firmness in tank wagon markets, reflecting the stronger situation at the refineries, featured the refined products market in this area during the week. The outstanding development in this connection was an advance of one-half cent per gallon in tank wagon and service station prices by Standard of New Jersey on Tuesday, the advance being effective at all points in its territory with the exception of Delaware.

The retail gasoline situation has shown considerable improvement at many points in East Coast territory during recent weeks, and many of the "sore spots" which formerly existed in principal marketing centers have been eradicated. Philadelphia is an exception to this general rule, however, marketers in that city being compelled last week to cancel an advance of 1 cent per gallon in tank wagon quotations, following the failure of one marketer to meet the advance.

The New York area is likewise more unsettled, from the retail price standpoint, and this condition is militating against a stronger posted price basis, which would appear to be justified by the rising gasoline quotations at refineries. A number of independent organizations of service station operators have been formed in the metropolitan area, and it is believed that these groups, with the co-operation of leading marketers, may be able to relieve the situation somewhat.

Aside from gasoline, the remainder of the refined products list was without quotable change during the week, trading being along routine lines. Operations of refineries in this section continue along curtailed lines, with refiners making efforts to further reduce their surplus stocks of products.

Refinery Gasoline

The market was well maintained during the week at the half-cent advance recently put into effect, and refiners were looking for continued firmness. Gallonage eased off somewhat during the week, under the influence of unfavorable weather for motoring, and jobbers were showing some disposition to taper off their buying operations, although continuing to carry a fair amount of storage motor fuel, due to the strong position of the market.

Two cargies of motor fuel were reported contracted for during the week for shipment to New York from the Gulf. The cargoes, reported at approximately 80,000 bbls. each, were booked at a reported price of 5 cents per gallon, delivered New York. The gasoline involved reputedly is under 65 octane number, buyers having been unsuccessful in obtaining 65 octane gasoline at the price they were willing to pay.

Refiners are centering much of their sales attention in the tank car market to premium grades of motor fuel, the weather now being more seasonable for sales pressure on the higher quality gasolines. Shipments of California gasoline eastward have been interfered with somewhat by the recent landslides in the Panama Canal, which held up a number of tankers for practically a week during which the engineering forces at the canal were laboring to clear the channel.

Tank Wagon Gasoline

Leading brands of gasoline are available at filling stations in the metropolitan area at as low as 8 gallons for $1, and the competitive situation has again slipped back to its former unfavorable position, although the "relapse" has not been as drastic as that which the market suffered during the late summer.

Recently formed associations of service station operators in the several boroughs are making efforts to stabilize the situation, and call a halt to price cutting activities, and it appears that these efforts will meet with some success. It has been estimated by one such group that sales of gasoline at 8 gallons for $1, tax paid, nets the station operator a loss of close to a half cent on each gallon sold.

Cold and rainy weather throughout the greater part of the East during the week has been paralleled by a sharp contraction in gasoline demand, and it is this situation, more than anything else, that has been responsible for the growing price cutting competition, although the basic trouble, of course, is the uneconomic multiplicity of retail stations servicing motorists in this area.

Announcement of a new grade of Ethyl Gasoline has served to further complicate the gasoline quality situation. If the plans of the Ethyl Corp. are carried out as originally announced, it appears likely that regular grades of gasoline, leaded, will take the place of the present "regular priced" motor fuels offered by leading refiners, and that unleaded fuels, of 65 octane number or under, will constitute the third grades.

Kerosene

Refinery demand for kerosene has shown substantial improvement during the week, and indications are that gallonage for the closing half of the month will exceed that for the full month of October. Refiners are quoting the market firm at 5½ cents per gallon for 41-43 water white in tank car lots, and report that jobbers have come into the market for supplies in considerable volume.

The tank wagon kerosene situation has stiffened in response to the recent mark-up in refinery quotations, and there has been an appreciable increase in gallonage during the week. Leading integrated companies are stocking kerosene at their gasoline filling stations, and report that the outlook indicates a materially enlarged volume of sales in this division during the current year.

Fuel Oil

Sentiment in the heavy oil division of the trade has shown a pronounced trend toward the constructive side, and with indications pointing to a determined effort on the part of the world industry to arrive at an international accord for the limitation of crude production until stocks of surplus refined products have been worked off, refiners believe that the fuel oil situation can reasonably be expected to show improvement next year.

Refiners continue to quote bunker "C" oil on the basis of 70 cents per barrel, in bulk, fo..b. refinery terminals, and 75 cents per barrel barged alongside within harbor limits. There has been some improvement in the demand from marine consumers, this being due in some measure to the fact that a number of the large transatlantic liners are now temporarily engaged in the coastwise cruise service out of New York, and are doing the bulk of their bunkering there.

Contract business for 1932 has been taken in large volume.

Diesel Oil

Spot movement of Diesel oil has shown a little pickup during the past week, and the market remains steady and unchanged at $1.30 per barrel, bulk, f.o.b. refinery terminals, with the usual charge for delivery alongside within harbor limits.

The outlook for the heavy oil market in Europe for 1932 is improved somewhat, refiners believe, and some hopes are expressed regarding a more favorable selling price for Diesel oil during the coming year. Contract business for next year continues to be booked on the basis previously outlined in these columns.

Gas Oil

Industrial consumption of gas oil is on the increase, and a firmer undertone is discernible in eastern markets, with refiners holding 28 plus recycled oil at 4 cents per gallon. Buyers have been looking for gas oil in California and at the Gulf, it is reported, but have been unable to line up any cargoes at the prices which they are willing to pay for nearby deliveries.

Lubs

Trading in the cylinder oil market has slackened off, owing to the recent price unsettlement in that division, and while quotations have not shown any further revisions during the week under review, the market is still somewhat unstabilized, with an easy undertone prevailing. Buyers are reported well covered on their prompt and nearby requirements, and the outlook indicates "watchful waiting" on the part of large scale operators until the situation becomes more normal. Refiners in most instances continue to show firm price views, but it is generally felt that the market is not yet on a "trading basis."

Industrial lubs have gone through another quiet week, no price revisions developing during the period, and business holding up fairly well.

Wax

Quiet trading was reported during the week on both crude scale and fully refined grades, quotations remaining unaltered. Manufacturing consumers are taking stocks only as needed, and operators look for continued routine operations until after the turn of the year, due to the unwillingness of buyers to load up prior to year-end inventories.

Furnace Oil

The market is showing a strengthening tendency, although no actual price advances have materialized as yet. Consumption has shown a substantial gain during the week and marketers have had their tank wagon fleets busy in making deliveries to domestic consumers.

Export Market

A quiet week was reported at the Gulf, with no new fixtures. Recent price advances on both gasoline and kerosene for export have apparently killed off foreign buying interest, for the time being, at least, but despite this fact refiners continue to show firm price views.

Tampico crude is available for delivery over 1932 at 55 cents per barrel, f.o.b. ports, plus taxes, and it is expected that some business will be closed with Europe during the coming month. Mexican production is being sharply curtailed, and traders look for a higher market.

Venezuelan crude is offered at 47 cents per barrel, prompt shipment, with some oil available on 1932 contracts at 50 cents per barrel, for delivery over the first six months of the coming year. Sellers are not inclined to name a price for deliveries over the full year, and evidently are anticipating a stronger market in the second half of 1932.

California Oil Receipts

Receipts of California crude and refined petroleum at Atlantic and Gulf Coast ports for the week ended November 14 totaled 317,000 bbls., a daily average of 45,286 bbls., compared with 357,000 bbls. a daily average of 51,000 bbls. for the previous week, and a daily average of 38,143 bbls. for the four weeks ended November 14. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast ports:	
New York	175,000
Philadelphia	116,000
Total	291,000
Daily average	41,571
At Gulf Coast ports:	
Total	26,000
Daily average	3,715
At Atlantic and Gulf Coast ports:	
Total	317,000
Daily average	45,286
Daily average four weeks	38,143

Distribution of total California oil receipts is as follows:

At Atlantic Coast ports:	
Gasoline	196,000
Fuel oil	95,000
At Gulf Coast ports:	
Gasoline	26,000

There were no shipments of California refined products for Atlantic or Gulf Coast ports reported during the week. This is due, it is believed, to the recent blocking of the Panama Canal by landslides, holding back traffic for a number of days and making for some congestion of tankers at that point.

Imports

Imports of crude and refined petroleum at the principal United States ports for the week ended November 14 totaled 718,000 bbls., a daily average of 102,571 bbls., compared with 1,840,000 bbls., a daily average of 262,857 bbls. for the previous week, and a daily average of 208,857 bbls. for the four weeks ended November 14. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast ports:	
Baltimore	150,000
Boston	39,000
New York	427,000
Philadelphia	62,000
Total	678,000
Daily average	96,857
At Gulf Coast ports:	
Galveston district	40,000
Total	40,000
Daily average	5,714
At all United States ports:	
Total	718,000
Daily average	102,571
Daily average four weeks	208,857
Distribution of total imports is as follows:	
Crude	410,000
Gasoline	39,000
Gas oil	92,000
Fuel oil	177,000

Petroleum Exports

Some slackening off in export gallonage of principal refined products developed locally, and the market had quieted down considerably following the rather

large export volume during the closing half of October. The following table shows principal exports of refined petroleum products from the port of New York for the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Nov. 14	Nov. 7	Oct. 31
Gasoline	180,000	65,000	70,000
Naphtha	852,000	310,000	880,000
Kerosene	32,000	32,000	22,000
Fuel oil	2,000	8,000	330,000
Lubricating oil	678,000	785,000	1,345,000
Petroleum, ref.	595,000	1,360,000	1,502,000
	Pounds		
Petrolatum	13,000	34,000	35,000
Paraffin wax	2,375,000	1,225,000	5,340,000
Refined	285,000	.....	260,000
Scale	375,000	130,000	320,000
Lub. grease	800,000	685,000	1,130,000

Charter Market

Practically all of the activity in the tanker charter market during the week was for movement of oil from Black Sea ports, the American market being dull. Tanker rates continue at low levels and considerable distressed tonnage is still reported. Fixtures reported during the week were as follows:

Motorship Ranja (Nor.), 3,753 tons net, clean, Black Sea to North of Hatteras, p.t. November loading. (Note—This fixture, it is believed, indicates a direct shipment of Rumanian gasoline to Baltimore, Philadelphia, New York or Boston.)

Motorship Woensdrecht (Dutch), 6,000 tons, clean, Constanza to Havre/Rouen, 8/6, November loading.

Steamer Myriel (Dutch), 4,300 tons, clean, Constanza to North Africa or French Mediterranean, 42 frans, option Russian Black Sea loading, 46 francs, November loading.

Steamer Haxsten (Nor.), 3,720 tons net, dirty, Constanza to Nynashamn, 8/-, November-December loading.

Steamer Moordrecht (Dutch), 4,398 tons net, clean, Black Sea to U.K./Continent, 7/-, November-December loading.

Steamer Stegg (Nor.), 3,610 tons net, clean, Black Sea to Continent, 7/-, November-December loading.

Steamer Solstein (Nor.), 3,196 tons net, or Storsten (Nor.), 3,114 tons net, 4,400 tons, clean, Black Sea to Continent, 8/-, completing with 3,000 tons, clean, Batoun to Rotterdam, 9/-, December 15/January 5 loading.

Steamer Nyholt (Nor.), 4,807 tons net, dirty, time charter, open seasons of 1932 and 1933, 5/-.

PREPARE FOR HIGHER OCTANE RATINGS

(Continued from Page 78)

of from one-half to 1 cent above the regular grade. It appears that there is very little of this material available on the open markets. Gasoline tank car prices quoted in Chicago district Monday are as follows: U. S. Motor gasoline of no octane specifications, 4¼ to 4⅜ cents; 60-62 400 endpoint gasoline, 4⅜ to 4⅝ cents; 64-66 375 endpoint material, 4⅝ to 5 cents; 68-70 360 endpoint gasoline, 5 to 5¼ cents; 64-66 437 endpoint blended gasoline, 4 cents. The price on the last named material is purely nominal and reflects the weakness in the natural gasoline and naphtha markets. The 50-52 450 endpoint naphtha moved down to 4 and 4⅛ cents.

The kerosene tank car markets were unchanged in price with the 41-43 water white material offered at 2⅛ to 2¼ cents, and the 42-44 water white kerosene quoted at 2¼ to 2½ cents.

Fuel Oils and Gas Oils

In Chicago proper, there has been an unseasonal revival of building activity which is held to presage an industrial awakening, but this source of demand is still in the future. The unusual weather which has prevailed in the district, somewhat too damp for motoring and too warm for home heating, has had a serious effect on the distillate markets. The few cold snaps that have appeared have so far been unattended by winds for which the city is famous and the burning oil distributors are still waiting for their season.

Most of the independent distributors boosted their tank wagon prices from a quarter of a cent to one-half cent about a month ago, and they feel a keen resentment toward the weatherman. Prices quoted Monday on the best grades of material are as follows: 18-22 fuel oil, per barrel, 32½ to 37½ cents; 22-26 fuel oil, per barrel, 37½ to 42½ cents; 28-30 fuel oil, zero, per barrel, 52½ to 57½ cents; 32-36 industrial gas oil, per gallon, 1⅝ to 1¾ cents; 32-36 zero gas oil, 1⅞ to 2⅛ cents; 38-40 straw distillate, 2 to 2¼ cents.

OKLAHOMA FIELDS

(Continued from Page 34)

nominations to 800 bbls. At the last proration hearing it was estimated that the potential of the West Perry Field was 3,150 bbls. a day and the Champlin Refining Co. stated it would purchase the entire output if the increase was allowed. All the producing wells in the field are owned by the Magnolia Petroleum Co.

Seminole Potentials

The potential gauges in the Greater Seminole area indicate that the area will be under the estimated figure. Some express the opinion the area will total approximately 295,000 bbls. a day against an estimate of 305,000 bbls. a day. Ten-day gauges have been completed in nine pools and incomplete from 10 other pools.

In some of the pools the gauges showed a higher production than the estimated potentials, while others show a sharp decline. The entire area is showing a decline of approximately 18 per cent compared to the previous potential gauge.

Gauges were completed in Allen, West Asher, Old Earlsboro, Earlsboro townsite, Konawa, Sasakwa, Seminole, East Seminole and St. Louis Pools.

Pool—	Bbls. New Pot.	Bbls. Est. Pot.
Allen	18,862	18,320
West Asher	8,350	29,396
Old Earlsboro	25,258	25,307
Earlsboro townsite	3,220	4,508
Konawa	13,224	22,636
Sasakwa	2,721	3,283
Seminole	24,467	23,060
East Seminole	2,511	2,424
St. Louis	35,518	32,590
Total	134,131	161,524

New Locations

New locations announced in the Greater Seminole area include, Prairie Oil & Gas Co.'s No. 3 Hassman, NW cor. SE NE, Section 3-8-5, Carr City extension area; Gypsy Oil Co.'s No. 2 Tiger, NE cor. SW NW, Section 3-8-5, preparing to start drilling; same company's No. 7 Coker, NW cor. SW SW, Section 2-8-5, a location; Amerada Petroleum Corp.'s No. 3 Tiger, NE cor. SW NE, Section 3-8-5, rigging up, and the same company's No. 4 Tiger, SE cor. NW SE, Section 3-8-5, a location.

Field activity in the State shows an increase over the September total. It is believed that Oklahoma's drilling record this year will fall below that of other recent years. Some of this curtailment of operations is due to strict proration regulations that have been in force due to the large overproduction. Very few wildcat tests have been started in the State during the last 12 months and what few there have been are now shut down or have been abandoned as dry holes.

Oklahoma City the Most Active

The Oklahoma City Field continues to be the most active area in the State. Drilling deeper and plugging back have been the main work in the older districts in the State, including Greater Seminole, Okmulgee, Cushing and parts of Muskogee areas. Of the older areas nothing is expected that will cause an increase in the daily average production in the State. These areas are now being prorated under the Class "A" ruling which permits wells of over 20 bbls. to produce 50 per cent of their production.

In the western part of the State there are one or two areas that might be developed and increase the State's production. One of these is the Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 1 Messer, in SW cor., Section 32-14-3w, Oklahoma County, several miles north of the Oklahoma City Field. The well was completed about a year ago and has been shut in since. Eason Oil Co. has a one well pool in Logan County, west of Guthrie, and Sinclair Oil & Gas Co. has a wildcat gas well the most westerly producing well in the State on a large block of acreage in Harper County.

On September 1, there were 263 operations listed in the State, of which 213 were active. On November 1 there were 314 operations listed in the State and 294 were active. This compares unfavorably with a total of 479 operations on January 1, 1931, with a total of 396 active.

State's Deepest Test

Oklahoma's deepest well was undergoing a cleaning out and bailing test and from reports the test is showing some oil and gas. It is the Mid-Kansas Oil & Gas Co. and Ramsey Petroleum Co.'s No. 6 Preston-Culp, NW cor. NE, Section 6-5-9w, on the west side of the Cement Pool, in Caddo County. The total depth is 10,079½ feet, with the special 6-inch casing landed at 9,777 feet. The reports from the well show that oil and gas were coming through the mud while bailing around 6,500 feet. It is believed the present showing is coming from the last 20 feet of hole. If the well is not a commercial producer at the present total depth, the hole will be plugged back and the casing ripped to test showings found in upper formations. Oil and gas showings were found in formations at 8,395-8,410 feet in gray sand, at 7,311-30 feet, in hard gray sand, at 6,767-72 feet, in hard gray sand, and at 6,040-80 feet in brown and gray sand. All of these showings have been cased off when the 6-inch casing was cemented at 9,777 feet. The 9-inch casing was landed at 5,531 feet. Showings of oil and gas were found in shallower sands, both of which are regular producing horizons in the field. The first was found at 3,280-3,300 feet and the second at 3,375-3,406 feet.

New Leasing

The surrendering of leases is not so prevalent since the recent increase in crude oil prices. There is a slight increase in the taking of new leases in the older areas close in to other producing wells. Only the following areas are active from a leasing standpoint: The edges of the Oklahoma City Field, and some new work in Noble, Lincoln and Creek Counties, with some scattered buying in southern Oklahoma. In Noble County the following tracts have been leased by the Empire Oil & Refining Co.: SW, Section 9-21-2; SE, Section 6-21-2; S half NW and NW SE and E half NE, Section 31-22-2; NE, Section 24-21-3. The Gypsy Oil Co. has leased the W half SW and SE SW, Section 24-21-1, and S half SW, Section 26-21-1. In Kay County, Harris and Haun, Inc., has leased the S half NE, Section 28-28-1w. In Creek County, Mid-Continent Petroleum Corp. has leased the E half NE, Section 14-14-7. Amerada Petroleum Corp. has leased the W half SE, Section 18-17-10. In Payne County, Hargrove Hudson has leased the NW SE, Section 14-18-3; Ben H. Levy has leased the SE, Section 21-19-6; C. S. French has leased the E half SE, Section 13-19-5. In Lincoln County, R. L. Kemp has leased the N half NW and the E half W half NE, Section 35-17-6, and SE SE, Section 26-17-6.

In Stephens County, Mid-Continent Petroleum Corp. has leased the N half SW, Section 7-1s-5w, and the Carter Oil Co. has taken an extension on some of its scattered leases in Section 14-3s-5w. In Jefferson County, Gypsy Oil Co. has taken a lease on the NW SW, Section 2-6s-4w.

The leases being surrendered are in the western part of the State and in wildcat territory. In Alfalfa County, Indian Territory Illuminating Oil Co. has surrendered the SW, Section 28-26-9w; NW, Section 32-24-10w; the W half NE, Section 35-24-10w; E half NW, Section 20-25-9w; NE, Section 11-28-9w; SE, Section 2-28-9w; N half NW, Section 15-25-10w; the W half SE and SE SE, Section 35-26-10w; the NW, Section 27-26-9w, and SE, Section 33-26-9w. In Harper County, companies surrendering leases include Sinclair Oil & Gas Co., Rogers Oil & Gas Co., Phillips Petroleum Co., Wilcox Oil & Gas Co. In Blaine County, the Sinclair Oil & Gas Co. has surrendered a number of tracts in Townships 17-11w, 17-10w, 18-11w, and 16-10w. In Kingfisher County, the Indian Territory Illuminating Oil Co. has surrendered leases on 10 tracts in Townships 19-9w, 19-8w, and 19-7w.

In Pottawatomie County, the Tidal Oil Co. has surrendered a number of tracts in Townships 10-3, 11-4, 10-5 and 11-5. In Garvin County, the Shell Petroleum Corp. has surrendered leases in Sections 25-1-3w and 31-3-3. Skelly Oil Co. has surrendered acreage in Section 5-3-3w, and in Sections 18 and 29-4-3w.

Seminole Production

The production from the Greater Seminole area for the week ending November 20, was approximately 175,775 bbls. The first 12 pools listed below comprise the Seminole area which averaged 146,880 bbls.:

Pool—	Bbls.
Little River	35,040
East Little River	9,090
Carr City	6,645
Maud	4,965
Mission	16,070
Bowlegs	19,175
Earlsboro	7,510
South Earlsboro	3,975
East Earlsboro	19,160
Seminole	18,755
East Seminole	940
Searight	5,535
Total	146,880
Allen	5,710
Asher	720
Wanette	4,510
Konawa	6,010
Sasakwa	1,900
St. Louis-Pearson	10,045
Total	175,775

The daily production from the Oklahoma City Field for the week ending November 21, was as follows:

Date—	Prod.	Wells
November 15	181,081	115
November 16	173,014	115
November 17	173,291	124
November 18	195,328	139
November 19	210,247	164
November 20	198,925	166
November 21	140,651	141

Creek County

The Texas Company made location for No. 8 Weaver, NW cor. NE SE, Section 13-19-8. Phillips Petroleum Co. and Gled Oil Co.'s No. 7 Carter, SE cor. SW SE Section 20-19-9, is spudding. Michigan Petroleum Co. has the rig up for No. 1 Doty, NW cor. SE Section 1-18-7. O. C. Baltzell and others moved a machine in for No. 2 J. A. Land, NW cor. SW NW Section 11-18-11. N. D. Gentner and others' No. 1-A Watashe, SE cor. SW Section 4-17-10, is a machine. Bryan Petroleum Co.'s No. 2 Bucktrot, C SW NW Section 35-17-10, is spudding. Johnson Oil & Refining Co.'s No. 1 Flinchum, NW cor. SE SW Section 11-19-9, has been completed for 5,500,000 feet of gas in sand at 2,092-2,102 feet. Roy Dean and others' No. 1 Boyd, CWL E half NW Section 30-19-9, has been abandoned at 3,108 feet in Wilcox sand. O. C. Baltzell and others' No. 1 S. Lyons, SE cor. NE Section 11-18-11, made 20 bbls. in sand at 1,424-51 feet after a 30-quart shot. Liberty Pipe Co.'s No. 1-A Land, NW cor. SW Section 12-18-11, has been completed for 10 bbls. in sand at 1,390-1,410 feet after shooting 50 quarts.

Hughes County

Perrine and others' No. 1 Walker, C NE NE Section 15-7-8, is a cellar.

Lincoln County

Kemp & Nunnellee and others' No. 1 Kannady, SE cor. SW SE Section 26-17-6, is spudding.

Muskogee County

Robinson Oil Corp. moved a machine in for No. 2 R. Collins, NW cor. SE Section 17-13-16. W. F. Simpson's No. 1 M. Sango, SW cor. NW NW Section 17-15-18, has been abandoned at 1,890 feet. M. S. Mussellem's No. 1 Townsite, Lot 8, Block 18, SE cor. SW SE SE Section 28-15-18, is dry and abandoned at 1,218 feet. W. J. Metzger's No. 12 L. Francis, SE cor. SW NE SW Section 1-14-18, an old well deepened to 1,888 feet, has plugged back to the original sand, 888-908 feet, and completed for 5 bbls. Robinson Oil Corp.'s No. 3 W. Brown, SE cor. NE Section 18-13-16, has been completed for 1,500,000 feet of gas in sand at 530-40 feet.

Noble County

Continental Oil Co. moved the rig in

for No. 1 Waltermire, C NE NW Section 33-21-1w.

Okfuskee County

R. C. Walker's No. 1-A L. Myers, CEL SE NW Section 3-11-11, has been completed for 20 bbls. after shooting 5 quarts in sand at 2,690-91 feet.

Oklahoma County

Anderson & Kerr made location for No. 1 Gibbons, Block 2, Meads Second Addition, SW cor. SE SW SE Section 34-12-3w, Oklahoma City Pool. T. B. Slick estate's No. 2 Long, Block 23, Fruitland Addition, NW cor. SW SE Section 15-11-3w, is a rig under construction. Phillips Petroleum Co. made location for No. 1 Ira, Block 11, Lots 15 and 16, Carney Heights Addition, NW cor. SE NE Section 22-11-3w. H. F. Wilcox Oil & Gas Co. and Marshall's No. 1 Keller, SE cor. NW NW Section 10-11-3w, has been completed for 4,100 bbls. in four hours from Wilcox sand topped at 6,330 feet, total depth 6,540 feet. Plains Oil Co. and Capitol Producing & Refining Co.'s No. 1 Baum, SE cor. NW Section 15-11-3w, topped Wilcox sand at 6,375 feet, drilled to total depth of 6,530 feet and made 4,903 bbls. in four hours.

Osage County

J. E. Cooper's No. 1 NW cor. NE SE SE Section 26-21-10, has been completed for 40 bbls. in Bartlesville sand at 1,925-64 feet.

Pawnee County

Swift and others' No. 1 School, SW cor. NW NW Section 33-20-9, is spudding. H. D. Hambley and others' No. 1-A Baker, SW cor. NW SE Section 35-20-9, is drilling at 375 feet. I. F. Hoss' No. 1 E. Peterman, SE cor. NE Section 15-20-9, has been completed for 12 bbls. in Bartlesville sand 2,206-22 feet. Burton & Holmes' No. 1 Cunningham, CEL NW SW NE Section 18-20-10, is dry and abandoned at 2,400 feet.

Pontotoc County

Myers & Atkins' No. 1 Myers, NE cor. SE SE Section 21-5-6, has been completed for 124 bbls. in sand 1,617-19 feet.

Seminole County

Burke Greis and others' No. 1 Catlett, SW cor. Section 20-7-8, is rigging up rotary tools.

Tulsa County

J. E. Martin & Cummings' No. 3 Bunger, SE cor. SW NW Section 27-17-13, is drilling at 350 feet. S. W. Anthony's No. 8 Whetstone, SE cor. NE SW Section 3-16-12, is drilling at 600 feet. J. E. Martin & Cummins' No. 2 Bunger, CSL NW NW Section 27-17-13, has been completed for 75 bbls. in sand at 1,989-2,004 feet.

Wagoner County

W. J. Metzger moved a machine in for No. 6 J. Wilson, SW cor. NW Section 30-17-17.

ROCKY MOUNTAIN AREA

(Continued from Page 75)

the southwest. It is 400 feet lower structurally than the nearest producer.

Yellowstone Petroleum Co.'s No. 1, NW NE SE Section 7-57-97, Sage Creek, was abandoned at 4,080 feet. It had a show of oil in the Madison lime at 3,892-96 feet followed by water. The well was started by Producers & Refiners Corp. and drilled to the Tensleeep which had water at 2,870-2,928 feet.

Natrona County

Midwest Refining Co.'s No. 11 Middy, C NE NE Section 23-35-79, Midway Dome, is testing the second Wall Creek at a total depth of 5,193 feet after plugging back from the Sundance. So far the quantity of oil is not very large and a tool to break down the walls of the hole is being run.

Carbon County

Midwest Refining Co.'s No. 27 Union Pacific, NW SE SE Section 11-20-81, Elk Mountain, is bottomed at 4,020 feet and sidetracking tools.

Prairie Oil & Gas Co.'s No. 1, SE SE SW Section 29-27-89, Bunker Hill, is cementing the 9⅝-inch at 6,147 feet on top of the Dakota. The Muddy was very shaley and carried a little water and gas. The Frontier sands showed both oil and gas saturation.

Producers & Refiners Corp.'s No. 4, SW cor. SE Section 7-26-89, Wertz Dome, is bottomed at 3,541 feet and fishing for rods.

UTAH

Utah Southern Oil Co. has acquired a controlling interest in its operation on the Salt Valley Dome in Grand County, and is preparing to resume on its No. 1 Balsey, C NE NE Section 31-23-21, which is bottomed at 4,243 feet in salt.

Pipe Line Runs

Average daily pipe line runs for the week ended November 21:

	Bbls.
WYOMING	
Salt Creek	22,490
Big Muddy	1,760
Greybull	10
Dallas-Derby	920
Dutton Creek	70
Elk Basin	600
Ferris	30
Frannie	1,640
Grass Creek	3,070
Hamilton Dome	930
Hudson	170
LaBarge	1,070
Lance Creek	270
Lost Soldier	4,080
Oregon Basin	500
Osage	1,180
Pilot Butte	40
Rock River	1,760
Poison Spider	80
Teapot	20
Total Wyoming	39,740
MONTANA	
Buckley-Border	560
Cat Creek	930
Dry Creek	260
Kevin-Sunburst	4,660
Lake Basin	70
Pondera	1,280
Total Montana	7,760
COLORADO	
Florence	250
Fort Collins	960
Iles	910
Moffat	780
Orchard	700
Rangely	20
Tow Creek	310
Total Colorado	3,930
NEW MEXICO	
Rattlesnake	710
Hogback	490
Table Mesa	76
Artesia	500
Cap Rock	1,235
Hobbs	37,086
Jal	1,012
Lea City	2,340
Eunice	500
Total New Mexico	43,949
Total Rocky Mountain area	95,379
Total previous week	93,968
Difference	1,411

RUSSIA CHIEF BUYER OF OUR OIL EQUIPMENT

WASHINGTON, D. C., Nov. 23.—Soviet Russia in Europe was the outstanding customer for American petroleum and gas well drilling machinery and other petroleum and refinery machinery during September, in which month the Soviet Republic took $658,939 worth out of a total of $1,068,081 of these products sold abroad, according to a report issued by the Bureau of Foreign and Domestic Commerce.

Germany was the second largest customer purchasing $89,617 worth of such machinery. Purchases of other countries were as follows: Argentina, $62,565; Mexico, $55,770; British India, $47,091; Canada, $38,889; Japan, $3,582; Rumania, $16,925; Netherland East Indies, $11,356; Persia, $7,950; Spain, $7,424; Trinidad and Tobago, $5,650; United Kingdom, $5,315; Egypt, $3,124; Venezuela, $3,498; Brazil, $1,740; Peru, $1,802; and others taking nominal quantities—C. E. K.

BEATY TO SPEAK AT DALLAS

DALLAS, Tex., Nov. 23.—Selection of Judge Amos L. Beaty of New York, president of the American Petroleum Institute and former president of The Texas Corporation, as the principal speaker for the annual meeting of the Dallas Chamber of Commerce the night of December 1 was announced by President Arthur L. Kramer of the Dallas chamber. Judge Beaty Saturday signified his acceptance of the invitation to speak.

HEATING VALUE AS BASIS FOR GAS SALES

(Continued from Page 18)

line manufacturer and gas pipe line companies. Pipe lines, a thousand miles in length, are being constructed to practically all the centers of population from gas fields, having reserves of future recoverable gas that is estimated into the trillions of cubic feet, figures almost beyond our comprehension. Analyses of gases produced in some of the fields to which pipe lines are being extended is shown in Table No. 1.

Approximately 18,000,000 gallons of liquefied petroleum gases were marketed during 1930. This rapid growth can scarcely be conceived, as only 1,091,005 gallons were sold in 1927. They consist chiefly of propane and butane, which are obtained principally by fractionation of natural gasoline. Propane is stored in steel cylinders and used for cooking and heating in districts not served by gas pipe lines. This "bottled gas" industry has grown probably 400 per cent in the past three years. A large increase in the use of propane and butane is due to their recent extensive use, which when mixed with air, serve communities that are not large enough to warrant the installation of a manufactured gas plant. There has also been a large increase in the use of propane and butane as enriching blue water gas to a certain required calorific standard. Market conditions of petroleum products is in such a chaotic condition at the present time that casinghead or natural gasoline in tank car quantities is available in most of the Middle Western cities at prices ranging from 4 to 5 cents per gallon (delivered). No doubt this product, which is so admirably adapted to new uses in gas making and enriching, will be more extensively used for that purpose in the future.

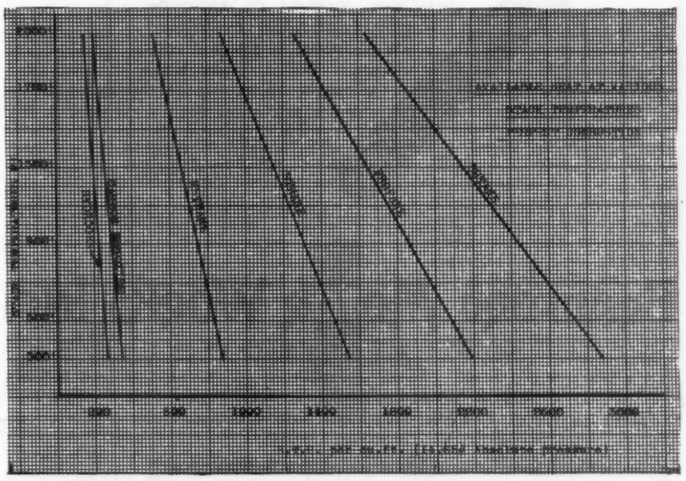

TABLE NO. 1—ANALYSES OF GASES FROM SEVERAL LARGE FIELDS

	(1)	(2)	(3)	(4)
Methane	94 1	68 5	73 7	97 3
Ethane	3 5	19.7	19 4	1 1
Carbon dioxide	0.5	0.3	0 1	0.6
Nitrogen	1 9	11.5	6.8	1.0
Total heating value*	1011	1041	1088	1000

*B.t.u. per cu. ft. (30" Hg/60° F.).
(1) Monroe, La. (2) Hugoton, Kans. (3) Panhandle, Tex. (4) Quinton, Okla.

Petroleum refiners apparently have not been alert to the monetary possibilities of the gas generated in the various cracking processes. They have used this gas at their plants for heating boilers, stills, etc., instead of the cheaper materials such as coke or residuum. The heating value of the gas varies from 1,400 to 1,700 B.t.u. The gas produced by cracking Oklahoma City crude oil in the Dubbs process gave 799 cubic feet of gas per barrel of oil processed. An eastern refinery employing the Gyro method of cracking, yields as much as 1,250 cubic feet of gas per barrel of oil throughput. This gas is an excellent blending agent or B.t.u. adjuster for producer or water gas and it is very rapidly being realized that it can be used at a considerable profit to both refiner and gas manufacturer. A recent refinery installation at Toledo, Ohio, shows this trend by the disposal of the gas to a large industrial consumer.

When gas is cracked by heating to relatively high temperatures it is considered as re-formed. If the product cracked is natural gas, then the re-formed gas will consist of hydrogen, carbon monoxide and methane, having a lower heating value but a larger volume than the initial gas and will more nearly resemble ordinary carburetted water gas. It can be used without any adjustment or modification of appliances when used as a substitute for manufactured gas. A large water gas plant at Chester, Pa., is operating to produce a gas comprising a mixture of about 50 per cent re-formed refinery gas and sufficient refinery gas is added to make a heating value of 530 B.t.u. At this plant, the production of 1,000 feet of gas requires approximately 300 feet of 1,600 B.t.u. refinery gas and 10 pounds of coke, giving approximately 90 per cent thermal efficiency. To effect the use of larger quantities butane and propane, it has been suggested that they be cracked and the volume increased possibly three-fold. There is some doubt, however, in the writer's opinion as to the feasibilty of re-forming perfectly good gaseous hydrocarbons at the reduction of a portion of their latent heat energy.

Heating Value as Sale Basis

The Bureau of Standards has suggested that a plan be initiated whereby gas would be sold on a heating value basis. The British companies have used satisfactorily the therm system. (A therm is 100,000 B.t.u.) Just recently a large gas company in Illinois, anticipating the completion of a large natural gas line, has established a rate fluctuating with the heating value of the gas sold.

Several years ago natural gas was developed in various sections in Kansas and Oklahoma, which possessed a very low calorific value, in fact, there were cases where the gas would not burn in a heated boiler and the drillers sometimes referred to it as "wind" gas. During recent months, a gas was encountered in Motley County, Texas, that showed 98 per cent nitrogen with only a trace of helium and combustibles. To take care of these natural gases and other contingencies which might conflict with the regulations of the State Corporation or utility commissions, 15 years ago gas pipe line companies stipulated in their purchase agreements, that gas must be "salable" or merchantable." These terms proved a great protection in many cases even after the pipe lines had been extended and the wells actually connected up. Now, gas analysis is or should be made of every prospective source of supply.

Some gas companies maintain at some point on their pipe line system a recording calorimeter, such as the Cutler-Hammer type, which is calibrated against a Sargent or Junkers flow type instrument. This record is used, when contractual

MW PRODUCTS for pumping wells
The KEY to LOWER LIFTING COSTS
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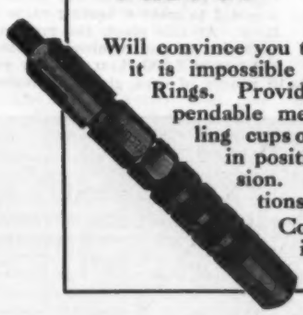

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heating value agreements have been made in certain competitive industrial sales.

One company in their industrial sales contract states that if the total heating value of the natural gas delivered to the customer during the calendar month, averages more than 1,050 B.t.u. or less than 950 B.t.u., then the average price for gas during such period shall be increased or decreased in direct proportion to the increase or decrease of the total heating value of the gas. The contract accurately defines a cubic foot and establishes beyond reasonable doubt the basis of heat units. This company has experienced very little complaint from even the largest industrial consumers, because of this clause in the contract, which has been actively operative.

Heat Units

In stating the heating value of a gas, it is necessary to establish a definite unit of mass or volume of the gas; it is further required to specify the conditions under which combustion is allowed to take place, that is, if the resulting products of combustion are cooled down to the original temperature of the gas, and if all the water vapor formed is condensed.

The total heating value of a gas is the number of B.t.u. produced by the combustion of that amount of gas, which will occupy a volume of 1 cubic foot at a temperature of 60° F., if saturated with water vapor and under a pressure equivalent to that of 30 inches of mercury at 32° F. and under standard gravity with air of the same temperature and pressure as the gas, when the products of combustion are cooled to the initial temperature of the gas and air, and when the water formed by combustion is condensed to the liquid state.

The net heating value of the gas is less than the total heating value by an amount equal to the heat of evaporation, at the initial temperature of the gas and air, of the water formed in the combustion of the gas. The water vapor formed during the burning of the gas remains in a gaseous state.

The gross heating value is intended to express the total heating value but is sometimes confused with the observed heating value as determined by a flow calorimeter. The gross therefore may differ considerably from the total heating value depending on the humidity. The reason being that relatively dry air entering a flow calorimeter causes to be carried out in the exhaust products a large amount of the water in the form of a vapor, which does not condense and therefore does not give up its latent heat.

The available heating value of a gas is the total heating value less the heat units carried away, not only by the uncondensed water vapor, but also by the other products of combustion and the excess air at the flue gas temperatures. Obviously as the stack temperatures increase, the available heating value of the gas becomes smaller. It expresses the loss of both sensible and latent heat.

It is evident that the same pressure and temperature basis as used in defining a cubic foot of gas as is stipulated in a sales or purchase agreement must be used for determination or calculation of the calorific value of the gas. If a gas is being purchased and measured on a 4-ounce basis (above an atmospheric pressure of 14.4 pounds/square inch), then for comparative purposes the heating value of several gases under various temperature and pressure conditions is shown in Table No. 2.

When the heating value of a gaseous fuel is not accurately defined, it is usually construed to mean the total heating value at 60° F. and 30 inches of mercury pressure.

Gas Analysis

A very reliable authority on natural gas states: "It must be understood that the heating value obtained by calculation is not necessarily the heating value which would be obtained by a calorimeter. Heating value determinations made from combustion analysis data are useful for comparative purposes and in making preliminary investigations." There are some objections to this statement in so far as it refers to natural gas. A vast amount of data is recorded in literature, which shows analyses of natural gases containing hydrogen, carbon monoxide, olefins, acetylene, etc., whereas recent analyses made with more modern methods and apparatus fail to disclose any other combustibles than paraffin hydrocarbons excepting very small quantities of hydrogen sulphide.

We can feel reasonably assured that the calorific value of a gaseous mixture of paraffin hydrocarbons as calculated from combustion analysis is accurate for the reason that the quantities of hydrocarbon components are calculated from the amounts of oxygen used, carbon dioxide and water formed during combustion. The heat of combustion of any paraffin hydrocarbon is (within the limits of experimental error) equal to the sum of the heats of formation of the water and of the carbon dioxide formed, as if the same quantities were produced by burning of the free elements. For example:

$$CH_4+2O_2=CO_2+2H_2O$$
$$-X+0=-94{,}300 \text{ cal.}-2\times 68{,}300 \text{ cal.}$$
$$X=213{,}800 \text{ cal.}$$

The heat combustion of methane is given[1] as 210,800 cal., so that the difference from that as observed and that as calculated from the heats of formation is slightly over 1 per cent. The same holds true with the other paraffin hydrocarbons; the method, however, cannot be applied if gas has been re-formed or mixed with gas from a refinery cracking plant. Endothermic compounds will cause considerable error.

Several years ago, the writer had occasion to compare the heating values of natural gases as calculated from combustion analyses with that determined by burning the gas in a Junker's flow calorimeter. The results of these tests are given in Table No. 3.

Allen and Burrell of the Bureau of Mines found that with natural gases below 1,100 B.t.u. they could check within 10 B.t.u. They were unable to obtain complete combustion in the calorimeter with richer natural gases. The heating value of the same gas calculated from combustion analysis and from data obtained by using the new fractional analysis method is shown in Table No. 4.

Effect of Pressure

The pressure base should be carefully analysed by both buyer and seller and a cubic foot of gas accurately and clearly defined in any sales or purchase agreement. Gas is usually sold on a pressure

[1]Kharasch, Bureau of Standards Journal of Research 2-359-1929.

TABLE NO. 2—HEATING VALUE OF VARIOUS GASES

		B.t.u. per cu. ft. at 0° C. and 760 mm. of mercury		B.t.u. per cu. ft. at 60° F. and 29.92 (1) In. mercury		B.t.u per cu. ft. at 60° F. and 30 (2) In. mercury		B.t.u. per cu. ft. at 60° F. and 30.55 (3) In. mercury	
	Chemical formula	Gross	Net	Gross	Net	Gross	Net	Gross	Net
Methane	CH_4	1,065	947	1,008	816	1,005	913	1,020	916
Ethane	C_2H_6	1,879	1,731	1,778	1,638	1,772	1,632	1,817	1,674
Propane ...	C_3H_8	2,656	2,461	2,513	2,329	2,504	2,321	2,568	2,380
Butane	C_4H_{10}	3,455	3,211	3,269	3,038	3,258	3,028	3,341	3,106
Carbon monoxide .	CO	341	341	323	322	322	322	330	330
Hydrogen ...	H_2	343	294	325	279	324	278	333	285

(1) 14.1 lbs./sq. in. (2) 14.65 lbs./sq. inch or 4 oz. above 14.4 base. (3) 15.025 lbs./sq. inch or 10 oz. above 14.4 base.

TABLE NO. 3—COMPARISON HEATING VALUE ANALYSIS AND CALORIMETER

	Net heating value — Calorimeter (B.t.u.)	Net heating value — Analysis (B.t.u.)	Total heating value — Calorimeter (B.t.u.)	Total heating value — Analysis (B.t.u.)
Average of 33 tests of an Oklahoma town's gas .	932	931	1,078	1,077
Average of 16 tests on the intake gas of a high-pressure gasoline plant	965	960	1,049	1,053
Average of 15 tests on the discharge gas of a high-pressure gasoline plant	940	940	1,035	1,031

base of 4 ounces above atmospheric pressure, which in the Middle Western states is usually 14.4 pounds per square inch. If the average of the barometric pressure for a given territory varies appreciably from this base, then a more representative figure must be used. In the Texas Panhandle the basis of measurement is computed on a barometric pressure of 13.2 pounds per square inch, while in Utah the pressure base is 12.6 pounds per square inch.

TABLE NO. 4

	Fractional analysis (%)	Combination analysis (%)
Methane	76.0	72.0
Ethane	14.0	22.0
Propane	4.0	...
Carbon dioxide	0.6	0.6
Nitrogen (residue)	5.4	5.4
B.t.u. (total) (calculated)	1,115	1,117

The Department of Interior has issued definite instructions which provide that the royalty on all gas produced on public lands must be reported on a base of 10 ounces above an atmospheric pressure of 14.4 pounds per square inch regardless of geographical location. This basis of settlement has been used for several years for gas transactions in the Osage Reservation in Oklahoma but it has not been generally adopted by the gas industry.

Gas may be sold on an absolute pressure base considerably different than that of the atmospheric pressure existing at the point of measurement, but in that case the gauge pressure must be changed accordingly or direct reading charts used where the static indicator is changed from the zero setting to compensate for this discrepancy.

Temperature

Temperature will affect the volume of gas to a degree similar in magnitude to pressure. The correction factor for positive displacement meters is:

$$\frac{520}{460 + \text{ave. temperature}}$$

This factor is given simply to show that in addition to pressure base, a standard temperature must be specified in order to definitely describe a volume of a given quantity of gas.

Recently the writer had occasion to make an investigation for a concern that was running a series of comparative tests to determine the most desirable furnace fuel. The gas company was measuring the gas at the plant site border, whereas the meter (positive displacement) measuring gas for the test was located in the same building and near the furnace. The average flowing temperature of the gas as shown by a recording thermometer was 110° F., which if not corrected to a temperature base of 60° F. would have penalized the gas costs nearly 9 per cent.

Humidity

Ordinarily, natural gas is dry. Heating value determinations made with either a flow calorimeter or combustion analysis, the gas becomes completely saturated with water vapor before it is measured. The volume is increased by the volume of the water vapor and may thereby lower the effective heating value of the gas as much as 2 per cent.

Even though natural gas is produced at low pressures with water, a large amount of this water vapor is squeezed out at the compressor stations where gas pressure is boosted to 300 or 400 pounds. On the contrary, manufactured gas before it is delivered to the consumers becomes saturated with water vapor in the floating type gas holders.

Thermal Efficiency

Particularly with industrial consumption, the total heating value as expressed at 60° F. is not always significant of its value. A complete study of the composition of the fuel, the temperature of the fine gases and feasibility of preheating should be made to determine the available heat in each particular problem.

Should the gas be used at a glass plant or smelter, the stack temperature may be as high as 800° F., even if waste heat boilers are installed. In this case it would seem more logical to use the net heating value than the total heating value of the gas, as it would be more significant when comparison is being made with a competing fuel largely carbonaceous. For example, a coal having a total heating value of 12,150 B.t.u. per pound and a hydrogen content of 5.92 per cent would have a net heating value of 11,595 B.t.u. per pound or a difference of only 4.78 per cent as compared with a natural gas having a total heating value of 1,008 B.t.u. per cubic feet and a net heating value of 916 B.t.u. or a difference of 10.44 per cent.

The greater the per cent hydrogen the larger will be the difference between the total and net heating values and the lower the thermal efficiencies at the higher stack temperatures. The available heating value of the above mentioned gas with a flue gas temperature of 700° F. and 20 per cent excess air would be 763 B.t.u. per cubic foot. Figure No. 1 shows the thermal efficiencies of several gases at various stack temperatures.

Gas has the advantage over both liquid and solid fuels, in that almost the theoretical quantity of air can be used in combustion, and dissipation of effective heat by excess air thereby prevented. The volume of air required per unit volume of different gases covering a wide range of calorific values varies considerably but the amount required for the evolution of a unit quantity of heat does not vary much, being about 600 cubic feet of air per therm of heat liberated.

In the domestic consumption of gas the temperature of the products of combustion is relatively low and the efficiency of the various commercial gases is practically the same. The problem is more complex with the industrial consumer, who is chiefly interested in the economics of fuel utilization. It is imperative for the combustion engineer to acquaint himself rather intimately with the prospective consumers' problems and methods of operation. This should embrace requirements as to the degree of purity of fuel, whether gaseous fuel is necessary or advantageous in quantity production equipment, and the efficiency with modern designed accessories, and cost and availability of the supply of the competitive fuels.

NORTH AND WEST TEXAS

(Continued from Page 26)

feet, total depth 1,143 feet, plugged back to 1,138 feet, initial production 10 bbls.

Cooke County

The Texas Company's No. 1 Marty, dry and abandoned, total depth 1,579 feet.

Grayson County

Harris & Haun's No. 1 J. Exstein, dry and abandoned, total depth 3,397 feet.

Young County

C. E. Beavers and others' No. 1 J. Rux, dry and abandoned, total depth 513 feet. Hamilton & Helm's No. 3 Russell, dry and abandoned, total depth 502 feet. King Royalty Co.'s No. 30 Larimore, oil sand 658-66 feet, initial production 96 bbls., total depth 666 feet. Kleiner & Rigg's No. 4 Larimore, dry and abandoned, total depth 720 feet. H. Shoup's No. 1 Cantwell, dry and abandoned, total depth 502 feet. Wheeler & Brashear and others' No. 1 Leberman, dry and abandoned, total depth 1,076 feet. Wellis and others' No. 8 Belknap, dry and abandoned, total depth 681 feet.

Wichita County

C. W. Clark's No. 1 Munger, dry and abandoned, total depth 1,857 feet. George J. Proctor's No. 5 Honaker, dry and abandoned, total depth 1,277 feet.

COMPLETIONS IN RANGER DISTRICT

Brown County

M. L. Richard's No. 1 C. A. Thomason, dry and abandoned, total depth 1,060 feet.

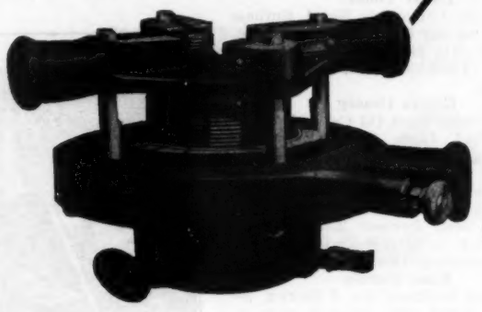
Eastland County

Wilkins and others' No. 3 T. C. Harrell, dry and abandoned, total depth 1,444 feet.

Coleman County

Centennial Oil Co.'s No. 2 N. D. Newton (correction, formerly reported as Continental Oil & Gas Co.), drilled deeper from 3,830-64 feet, initial production 200 bbls., flowing oil with 15,000,000 feet of gas. Centennial Oil &

ALL THAT A PIPE TOOL SHOULD BE



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Gas Co.'s No. 5-A Newton (correction, formerly reported as Continental), top pay 3,834-64 feet, initial production estimated 700 bbls., total depth 3,864 feet.

Palo Pinto County

Hoffman & Page Co.'s No. 1 W. Galena, top pay 2,978-85 feet, shot 50 quarts, initial production 7,000,000 feet of gas, total depth 3,006 feet.

COMPLETIONS IN WEST TEXAS

Fisher County

The Texas Company's No. 1 Burham (Daniel), top pay 3,097-3,101 feet, initial production 87½ bbls. flowing first hour, estimated 1,500-bbl. well, total depth 3,101 feet.

Gaines County

Texas Consolidated Oil Co. and others' No. 1 E. H. Jones, temporarily abandoned, total depth 4,685 feet.

Howard County

Continental Oil Co. and Group No. 1 Oil Corp.'s No. 6-A W. R. Settles, top pay 2,325 feet, increase 2,335-2,412-14, 2,425-39 feet, initial production 70 bbls. per hour swabbing, total depth 2,442 feet.

Jones County

Culberson Brothers' No. 1 Swann, total depth 2,940 feet, plugged back to 2,539-53 feet, initial production estimated 50 bbls.

Upton County

G. E. Farley and others' No. 2 John Lane, top pay 2,310 feet, initial production 195 bbls. pumping in 24 hours, total depth 2,325 feet.

Ward County

Prairie Oil & Gas Co.'s No. 1 H. Archenhold, top pay 2,475-77 feet, initial production 142 bbls. flowing through casing, total depth 2,486 feet. Wadsworth & Black's No. 1 L. H. Owenby, dry and abandoned, total depth 2,300 feet. Bell & Weir's No. 1 Boogher & Cummings, top pay 2,160 feet, initial production 10 bbls. per day spraying, total depth 2,210 feet.

COMPLETIONS IN PANHANDLE DISTRICT

Carson County

Texhoma Natural Gas Co.'s No. 2 Schaffer, top pay 2,360 feet, initial production 17,200,000 feet of gas, total depth 2,765 feet. Same company's No. 1 Dover, top pay 2,190 feet, initial production 45,300,000 feet of gas, total depth 2,385 feet. Same company's No. 1 Harrison, top pay 2,390 feet, initial production 35,400,000 feet of gas, total depth 2,635 feet.

NORTH TEXAS PRODUCTION

Week End'ng November 21

Panhandle district—	Bbls.
Carson County	6,324
Gray County	40,931
Hutchinson County	13,437
Moore County	1,180
Potter County	6
Wheeler County	612
Total production this week	62,484
Total production last week	60,488
Increase	1,996
Wichita Falls district—	
Archer County	12,393
Baylor County	567
Clay County	586
Cooke County	1,770
Foard County	70
Haskell County	19
Jack County	2,070
Montague County	4,047
Throckmorton County	540
Wichita County	17,992
Wilbarger County	12,036
Young County	12,086
Total production this week	64,176
Total production last week	65,211
Decrease	1,035
Ranger district—	
Brown County	2,940
Callahan County	1,520
Coleman County	3,032
Comanche County	770
Palo Pinto County	371
Eastland County	2,716
Shackelford County	3,385
Stephens County	4,219
Total production this week	18,953
Total production last week	19,029
Decrease	76

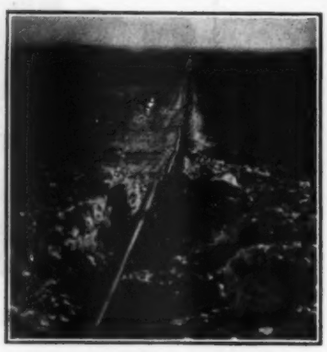
E. D. PHILLIPS DEAD

HOUSTON, Tex., Nov. 21.—E. Douglas Phillips, geologist for the Humble Oil & Refining Co., was killed in an automobile wreck near Destrahan, La., November 18. Mr. Phillips worked out of New Orleans, where he had made his home for a year, but previously had made headquarters at Baton Rouge and Houston.

TAKING NATURAL GAS TO FRONTIER AREAS

(Continued from Page 14)

sisting material was adjudged necessary for covering the pipe. The pipe from Fort Stockton on to Alpine and Marfa will also be coated. Blasting was necessary on the route from the field to Fort Stockton, over the rim rocks near the



Traversing the "wide open spaces" on the road to Fort Stockton from the Pecos Valley Pool. Blasting was necessary here on the rim of the Pecos Valley.

field, and across the caliche table lands.

The projected route from Fort Stockton to Alpine is also a most direct one, paralleling the railroad for nearly 36 miles. From Alpine the line will no doubt pass along the El Paso highway, approximately 4 or 5 miles, then enter and follow Hells Canyon to the summit of the Davis Mountains.

Cost of the line is estimated at $500,000, this covering distribution systems in the three towns to be served by the company. From the standpoint of future development the line occupies a most strategic location, having the possibility of being enlarged and extended into Mexico, and the smelters at Chihuahua City. It not only affords a market for the sweet gas of the Pecos Valley Pool, thereby establishing itself as a gas con-

Ditcher cutting 24-inch groove across table lands near Pecos Valley Pool.

servation project, but gives these remotely situated towns the most modern and satisfactory fuel, bringing more conveniences to people "west of the Pecos" and to practically the last frontier of the United States, thereby recording another marker for the gas industry's rapidly expanding program.

CONFERENCE ON COAL DISCUSSES NATURAL GAS

PITTSBURGH, Pa., Nov. 21.—An international host of scientists and engineers from 13 foreign nations, in this country to attend the Third International Conference on Bituminous Coal at the Carnegie Institute of Technology at Pittsburgh, heard George I. Rhodes, leading natural gas engineer and vice president of Ford, Bacon & Davis of New York, discuss the competition between natural gas and bituminous coal.

In his discussion of the rapid rise of the natural gas industry to its position as a major competitor of bituminous coal, Mr. Rhodes stated that following a period of fairly steady growth in the latter industry which continued until 12 years ago, production of bituminous coal suddenly ceased to increase. That this comparatively stationary production was due partly to the development of the natural gas field is not to be doubted, Mr. Rhodes stated. However, he continued, natural gas is but a minor factor in the present bituminous coal situation as a whole, although it is an economic competitor in certain sections of the country.

"Natural gas has for many years been a competitive factor and one of steadily increasing importance," he declared. "The recent spectacular development of natural gas pipe line systems is looked upon with considerable misgiving by bituminous coal producers. The publicity which has accompanied this recent development and the acute distress that has been suffered by coal mining operations in certain sections of the country might easily lead to the belief that natural gas is a primary cause of the trouble. On the other hand, it is easy to find data which places natural gas in a place of relative unimportance.

"Pipe lines, now under construction or placed in operation since 1929, have an aggregate daily capacity of about 1,000,000,000 feet. When these new lines are loaded to capacity, there will be a further annual consumption of about 250,000,000,000 feet or an increase of more than 25 per cent above the recent maximum consumption. Other lines are projected and it is reasonable to expect that there will be a still further large development of the natural gas business.

"Gas fields will support such increased consumption of natural gas for a sufficient period to attract new capital. Unless, however, there are important discoveries of new reserves, it is difficult to see how new lines can be justified which will increase the consumption of the fuel to more than about double its recent maximum.

"Notwithstanding the growth in use of natural gas, its competitive production is not large as compared with the production of bituminous coal. There is much speculation as to the amount of natural gas required to replace a ton of coal but it is a rare instance which requires as much as 25,000 feet of gas to do the work of a ton of coal and there have been instances where as little as 15,000 feet were required. The maximum recent consumption of natural gas that could in any way be considered competitive with coal has, therefore, been equivalent to approximately 47,500,000 tons of coal yearly or less than 10 per cent of the current annual bituminous coal production. The future natural gas consumption that can be reasonably foreseen would amount to a total equivalent of approximately 100,000,000 tons of coal a year or about 20 per cent of the present bituminous coal production.

"It must not be considered, however, that all of the natural gas consumption replaces coal. Much of it does but many of the large lines carry gas to replace fuel oil. Furthermore, much of the increased consumption of natural gas has been in a territory which has not been to any considerable extent a consumer of bituminous coal."

Standard line drip on the line between the gas pool and Fort Stockton.

Three welders working from each truck, welding the 4-inch line. This stretch is in the irrigated section near Fort Stockton

W. P. McCRAY DEAD

William Preston McCray, pioneer oil operator, life-long resident of Petroleum Centre, Pa., and one of the best known "old timers" in the northwestern Pennsylvania oil district, died on November 18 at the old homestead, Petroleum Centre, after a month's illness. He is remembered for drilling the first well on the historic McCray farm in 1873, at the age of 16.

He was postmaster at Petroleum Centre from 1876 to 1883. In the second great oil strike on the McCray farm, he shared jointly with the McElhaney-Espey interests.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 26)

ECTOR COUNTY

Weekly Oil Corp. et al's No. 1 Cowden, 1,980 ft. from N and W Sec. 33, Blk. 43, Twp. 2s, T.&P. Sur. ..... Drlg. 2,160 ft.

H. F. Wurtz' No. 1 E. A. Ibbetson et al, 330 ft. from N and E lines of NW, Sec. 16, Blk. 46, Twp. 3s, G.M. M.Br.&A. Sur. ..... S.D. 3,280 ft.

EL PASO COUNTY

Tri-State Oil Co.'s No. 1 Bobadella, 1,325 ft. from S and E lines Sur. 254, S.F. No. 7,247 ..... Drlg. 1,775 ft.

FISHER COUNTY

Cranfill & Reynolds' No. 1 George, 400 ft. from N and 330 ft. from E, Sec. 200, Blk. 1, B.B.&C. Sur. ..... Drlg. 3,505 ft.

Cranfill & Reynolds' No. 1 Snipe, 330 ft. from N and W lines of Sec. 195, Blk. 1, B.B.&C. Sur. ..... Drlg. 1,050 ft.

GARZA COUNTY

Penny & Posey's No. 1 Justice, 1,980 ft. from S and 1,650 ft. from E of Sec. 25, Blk. 6, H.&G.N. Sur. (2,500-ft. cable tool test) ..... Fishing for 6⅝-in. csg.: T.D. 3,320 ft.

HOWARD COUNTY

Green O. & R. Co.'s No. 1 Denman, 990 ft. from S and 2,310 ft. from W Sec. 14, Blk. 20, Twp. 1s, T.&P. Sur.. Spudded and S.D.

Merrick & Lamb's No. 2 Chalk, 990 ft. from the N and W lines of Sec. 125, Blk. 29, W.&M.W.R.R. Sur. .... T.D. 3,292 ft.; will plug back to 1,700 ft.

L. C. Harrison et al's No. 1 L. C. Denman, 2,310 ft. from S line and 330 ft. from E line of Sec. 10, T.&P.R.R. Sur., Blk. 30 ..... Rig.

IRION COUNTY

Davis et al's No. 1 Suggs, 1,560 ft. from S and 925 ft. from W Sec. 3,081, Blk. 28, H.&T.C. Sur. ..... Drlg. 5,285 ft.

Denny & Andrews' No. 1-A Tankersley, 200 ft. from S and 2,000 ft. from E of Sec. 709, J. P. Imhoff Sur... S.D. 463 ft.

Ellis Flanery Corp.'s No. 1 Nutt, 1,350 ft. from N and 450 ft. from E of Sec. 694, Kheikenheim Sur. ..... Fishing for tools 2,680 ft.

Stanolind Oil & Gas Co.'s No. 1 Williams, 1,320 ft. from S and E of Sec. 1,196, T.T.R.R. Sur. ..... Waiting on cement to set 6,755 ft.

Straughn & Adkins Bros.' No. 1 Lee, 1,980 ft. from W and 420 ft. from N of Sec. 729, C. Kaiser Sur. ..... Shut down 975 ft.

JONES COUNTY

Abers et al's No. 1 Burton, 150 ft. from S and 175 ft. from E of 43.4-acre tract in G. Martinez Sur. ..... S.D. 1,005 ft.; temporarily abandoned.

Johnson's No. 1 Huddleston, 165 ft. from S and W of N half of N half of Sec. 39, Blk. 18, T.&P. Sur. .... Location.

LOVING COUNTY

Ervin & Mahres' No. 1 Thrope, 2,310 ft. from E and 330 ft. from S Sec. 46, Blk. 53, T.&P. Sur. ..... S.D. 810 ft.

Slack's No. 1 Lynd, 990 ft. NE and 330 ft. SE of Sec. 3, Blk. 2, W.&N.W. Sur. ..... Fishing for tools 3,500 ft.

Falbre & Evans' No. 1 Dean, 330 ft. from NE and 990 ft. from NW Sec. 79, Blk. 33, H.&T.C. Sur. ..... S.D. 2,500 ft.

Lewis & Slagel's No. 1 Johnson, 330 ft. from N and 1,650 ft. from W Sec. 6, Blk. 56, Twp. 1, T.&P. Sur... Rigging up national machine

Lockhart & Co.'s No. 3 Bowen & Wells, 330 ft. from NE and SE of Sec. 92, Blk. 1, W.&N.W. Sur. ..... S.D. 3,385 ft.

Tennant et al's No. 1 Martin, 990 ft. from NW and SW Sec. 66, Blk. 1, W.&N.W. Sur. ..... Drlg. 2,600 ft.

MENARD COUNTY

Priest's No. 1 Sorrel, 1,000 ft. from E and 200 ft. from S cor. Sec. 132, E.L.R.R. Sur. ..... S.D. 2,860 ft.

PECOS COUNTY

Cardinal Oil Co.'s No. 1 J. H. Tippett ("J"), 1,980 ft. from the S line and 990 ft. from the W line of Sec. 2, D. F. Robertson Sur. ..... Location.

Dittman's No. 1 Sanford, 330 ft. from NW and 1,650 ft. from NE of Sec. 55, Blk. 10, H.&G.N. Sur. ..... Drlg. 470 ft.

Slaughter et al's No. 1 Sun Yates, 60 ft. S of Sun Oil Co.'s No. 1 Yates, Sec. 59, Blk. 1, I.&G.N. Sur. ..... Material.

REAGAN COUNTY

Carl Cromwell et al's No. 1 University, 1,320 ft. from S line and 1,320 ft. from E line of Sec. 4, University Blk. 7 ..... Spudded 55 ft.

Big Lake Oil Co.'s No. 6-C University, 1,370 ft. from S and 1,000 ft. from E Sec. 12, Blk. 2 ..... Drlg. 4,310 ft.

REEVES COUNTY

Cunningham et al's No. 1 Wright, 1,320 ft. from S and W Sec. 58, Cassel's Sur. ..... Spudded and S.D.

F. McDorman et al's No. 1 Ray Roberts et al, 2,310 ft. from S and E lines of Sec. 22, Blk. 59, P.S.L. Sur.... S.D.

James & Milton's No. 1 Patterson, 330 ft. from N and W of Sec. 21, Blk. 73 ..... Testing wtr. shutoff 3,330 ft.

Lee O. White et al's No. 1 Hershensor, 330 ft. from N and W lines of Sec. 5, Blk. 51, Twp. 10, T.&P. Sur... S.D. 5,044 ft.

RUNNELS COUNTY

Dutton et al's No. 1 Dean, 5,475 ft. from NE and 1,048 ft. from NW in J. Heil Sur. No. 519 ..... S.D. 3,700 ft.

SCHLEICHER COUNTY

Eastland Oil Co.'s No. 1 Joe Tisdale, C Sec. 29, Blk. M, G.H.&S.A. Sur. ..... S.D. 4,500 ft.; will drill deeper.

Wesner et al's No. 1 Nicks, 2,310 ft. from N and 2,362 ft. from E of Sec. 77, Blk. LL, T.C. Sur. ..... S.D. 5,060 ft.

George Wilson's No. 1 Page, Sec. 40, Blk. L, 1,290 ft. from N, 1,570 ft. from W, G.H.&S.A. Sur. ..... S.D. 5,053 ft.

SCURRY COUNTY

G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... S.D. 5,041 ft.

Scurry County Oil Exchange's No. 1 Earnest, 2,310 ft. from N and W Sec. 68, Blk. 3, H.&G.N. Sur. ..... Spudded and S.D.

Seifert & Dibble's No. 1 T. M. Blackburn, 2,310 ft. from N and 2,310 ft. from W line of Sec. 153, Blk. 97, H.&T.C. Sur. ..... Drlg. 3,635 ft.

Simon & Brock et al's No. 1 Cruse, 2,310 ft. from S and E Sec. 119, Blk. 97, H.&T.C. Sur. ..... S.O. 1,798, 1,820, 1,850 ft; S.D. 2,500 ft.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M-K-T Sur. ..... S.D. 2,669 ft.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Georgetown Ry. Sur. ..... Fishing for tools 3,150 ft.

Miller Bros.' No. 1 Allison & Burke, C NW cor. Sec. 10, Blk. 176, T.&P. Sur. ..... S.D. 120 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 Goode, 2,152 ft. from E and 330 ft. from S Sec. 24, Blk. 161, G.C.&S.F. Sur.. S.D. 6,120 ft.

Jones et al's No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&R.G.N.G. Sur. ..... S.D. 2,545 ft.

Sides et al's No. 1 Phelps, 2,157 ft. from N and 2,482 ft. from W Sec. 5, G. W. Turley Sur. ..... Shut down.

TOM GREEN COUNTY

Andrews' No. 1 Pugh, 250 ft. from N and 5,134 ft. from E, James Eldridge Sur. No. 73 ..... Drlg. 265 ft.

Belding & Dutton's No. 1 Norsworthy, 1,640 ft. from S and 587 ft. from E of John McNeese Sur. ..... S.D. 760 ft; S.O. and gas 725 ft.

Mintex Oil Co.'s No. 1 Campbell Est., 446 ft. from S and 630 ft. from W of Sec. 180, Dist. No. 11, S.P. Sur.... S.D. 1,994 ft.

Pratt & Hancock's No. 2 Lewis, 100 ft. N and 330 ft. E of most northerly SW cor. of Joshua S. Grant Sur. No. 2 ..... S.D. 200 ft.

UPTON COUNTY

T. P. Coal & Oil Co.'s No. 2 Shirk, 1,650 ft. from S and 330 ft. from E of Sec. 1, Blk. 3, M.-K.-T. Sur. ..... Drlg. 2,240 ft.

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We are pleased to announce the appointment of Bettis Sales Co. as our exclusive Mid-Continent representatives. The complete engineering department of the Regan Forge & Engineering Co. will closely co-operate with our newly appointed distributors, enabling us to serve you more closely. Prompt deliveries of all Regan products is assured.

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VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 10, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... S.D. 5,360 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... S.D. 6,780 ft.

WARD COUNTY

Abell Bros.' No. 1 Sloan, 330 ft. from NW and NE Sec. 24, Blk. 5, H.&T.C. Sur. ..... Drlg. 265 ft.
Alpine Oil & Dev. Co.'s No. 4 J. F. Boogher, 150 ft. from SE line and 150 ft. from the SW line of Tract 16, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Location.
Atlantic O. & P. Co.'s No. 1 Archenhold, 2,310 ft. from NE line and 330 ft. from NW line of Sec. 23, H.&T.C. Sur., Blk. 5 ..... Drlg. 1,540 ft.
Boogher's No. 1 fee, 235 ft. from SE and 2,553 ft. from NE Sec. 11, Blk. 5, H.&T.C. Sur. ..... Drlg. 775 ft.
Bradford-Bentley's No. 1 Beatty, 330 ft. from SW and NW of Sec. 3, Blk. 34, H.&T.C. Sur. ..... Drlg. 1,780 ft.
Eppenauer's No. 1 Purcell, 365 ft. from SW and 1,850 ft. from SE of Sec. 17, Blk. 34, H.&T.C. Sur. ..... Drlg. 325 ft.
H. V. Greer's No. 1 Carr, 150 ft. from NW and 510 ft. from SW Sec. 12, Blk. 5, H.&T.C. Sur. ..... Spudded and S.D.
Gulf Production Co.'s No. 17-B Hutchings, 330 ft. from N and 1,650 ft. from W of S 370 acres of Sec. 5, Blk. F, G.M.M.B.&A. Sur. ..... Location.
Hankinson et al's No. 1 Emery, 3,090 ft. from SE and 510 ft. from SW Sec. 26, Blk. 5, H.&T.C. Sur. ..... S.D. 2,238 ft.
Moran & Burkhart's No. 2 J. T. Sweatt et al, 2,310 ft. from the NE line and 1,170 ft. from the NW line of Sec. 12, Blk. 5, H.&T.C. Sur. ..... Location.
Moran & Miles' No. 1 Boogher, 3,603 ft. from NE and 1,303 ft. from SE Sec. 11, Blk. 5, H.&T.C. Sur. ..... S.D. 715 ft.
Massie-Sturm's No. 1 Green, 330 ft. from NW and SW Sec. 4, Blk. 34, H.&T.C. Sur. ..... Location.
R. F. Owen's No. 1 Lee, 1,344 ft. from NW and 4,533 ft. from SW Sec. 1, J. Howe Sur. ..... Drlg. 386 ft.
Prairie Oil & Gas Co.'s No. 2 Edmonson, 330 ft. from NW and SW of Sec. 23, Blk. 5, H.&T.C. Sur. ..... Location.
Rector Oil Co.'s No. 1 Smith, 1,320 ft. from N and E, Sec. 22, Blk. A, G.M.M.B.&A. Sur. ..... S.D. 3,602 ft.
Paul Ryan et al's No. 1 J. S. Reynolds, 4,110 ft. from NE line and 150 ft. from NW line, Sec. 12, Blk. 5, H.&T.C. Sur. ..... Csg. cmtd. at 2,014 ft.; T.D. 2,020 ft.
Sudderth & Carey's No. 1 J. H. Boogher et al, 150 ft. from SW and SE lines of Lot 24, Sec. 11, Blk. 5, H.&T.C. Sur. ..... Spudded and shut down.
Stanolind Oil & Gas Co.'s No. 1 Brown, 330 ft. from NW and SW Sec. 26, Blk. B-29 ..... T.D. 2,370 ft.; spraying 10 bbls. oil per day.
Shipley et al's No. 1 Monroe, 330 ft. SE SW Sec. 3, Blk. 1 ..... T.D. 4,666 ft.; will shoot.
White et al's No. 1 Burtner, 150 ft. from NE and 515 ft. from SE of Sec. 3, Blk. 32, W&NW Sur. ..... S.D. 755 ft.

WINKLER COUNTY

Liner Drlg. Co.'s No. 1 Campbell, 350 ft. from N and E cor. Sec. 2, Blk. B-5 ..... S.D. 4,640 ft.
Richardson's No. 1 Sealy, 330 ft. from S and W of Sec. 92, Blk. A, G.M.M.B.&A. Sur. ..... Rig up.
Siel Richardson's No. 1 S. M. Halley, 330 ft. from the S line and 1,650 ft. from the E line, Sec. 25, School Blk. B-12 ..... Location.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 26)

Graham et al's No. 1 Webb, 330 ft. from N and E of E half NE. Sec. 62, Blk. 25, H.&G.N. Sur. ..... Standardizing.
Jewel Oil Co.'s No. 1 Meers, 330 ft. from S and W of NW SW, Sec. 106, Blk. 3, I.&G.N. Sur. ..... Drlg. 315 ft.
Magnolia Pet. Co.'s No. 1 Arnold, 330 ft. from S and E, Sec. 149, Blk. 3, I.&G.N. Sur. ..... Cellar.
Magnolia Pet. Co.'s No. 1 Heaston, NE cor. 8¼ NE, Sec. 164, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,850 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Carpenter, 330 ft. from S and 990 ft. from W, Sec. 37, Blk. 25, H.&G.N. Standardizing.
Nelson et al's No. 1 Crews, 330 ft. S and E, NW, Sec. 12, Blk. 25, H.&G.N. Sur. ..... S.D. 2,619 ft.
Nipper et al's No. 1 Morse, 330 ft. from N and E, Sec. 1, Blk. 24, I.&G.N. Sur. ..... S.D. 2,365 ft.
Prairie Oil & Gas Co.'s No. 1 Morse, 350 ft. from N and E of Sec. 4, Blk. 24, H.&G.N. Sur. ..... Drlg. 515 ft.
Pulse-Shell Pet. Corp.'s No. 1 Wright, 330 ft. from S and W of Sec. 15, Blk. 3, I.&G.N. Sur. ..... Standardizing 2,643 ft.
Skelly Oil Co.'s No. 1 Heaston, 330 ft. from S and E N half NE, Sec. 164, Blk. 3, I.&G.N. Sur. ..... Drlg. 2,940 ft.
Saunders et al's No. 2 Sullivan, 322 ft. from W and 231 ft. from NE. 160 ft. S. 264 ac. of N½, Sec. 136, Blk. 3, I.&G.N. Sur. ..... Will plug back to 3,275 ft. and shoot.
Sullivan & Ochiltree's No. 1-A Morse, 330 ft. S and W, N½ NE, Sec. 15, Blk. A-9 H.&G.N. Sur. ..... Rig up and S.D.
Tarber's No. 1 Saunders, 330 ft. N and W, Sec. 3, Blk. 1, B.B.&S.F. Sur. ..... Location.
Quicksand Oil Co.'s No. 1 Chapman, 350 ft. from N and E, Sec. 69, Blk. 25, H.&G.N. Sur. ..... Drlg. 1,725 ft.
Vulcan Corp.'s No. 1 Carpenter, 330 ft. from S and E, Sec. 25, Blk. 25, H.&G.N. Sur. ..... Drlg. 1,715 ft.

HUTCHINSON COUNTY

Danciger O. & R. Co.'s No. 1 Johnson, 330 ft. N and W, SE, Sec. 34, Blk. Y, A.&B. Sur. ..... Spudded and S.D.
Deal O. & G. Co.'s No. 2 Sanford, 330 ft. N and E of N 80 ac., S 160 ac., Sec. 31, Blk. 46, H.&T.C. Sur. .... S.D. 450 ft.
Huber Prod. Co.'s No. 1 Johnson Bros. (Premier), 330 ft. N and E of W 60 ac., N 80 ac., NW, Sec. 3, Blk. Y, A.&B. Sur. ..... S.D. 3,016 ft.
Smith & McDaniel et al's No. 4 Pitcher, 990 ft. from S and 330 ft. from W, Sec. 19, Blk. M-21. Sur. ..... Drlg. 1,275 ft.
Smith & Daniels' No. 3 Pitcher, 990 ft. from S and 330 ft. from E. Sec. 19, Blk. M-21, T.C.R.R. Sur. ..... T.D. 3,152 ft; pay 3,070 ft; swbd. 80 bbls. in 4 hrs.
Skelly Oil Co.'s No. 1 Johnson Bros., 660 ft. S and W, SE, Sec. 30, Blk. Y, A.&B. Sur. ..... Top pay 3,070-95 ft; 500 ft. oil in hole; S.D. 3,115 ft.
Timms-Deatch's No. 4 Moore, 330 ft. N and W, Sec. 134, Blk. 4, I.&G.N. Sur. ..... Rig.

LIPSCOMB COUNTY

Okla. Public Service Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... T.D. 5,003 ft.

MOORE COUNTY

Gulf Prod. Co.'s No. 1 Burnett, 330 ft. from N and W, Sec. 356, Blk. 44, H.&T.C. Sur. ..... Drlg. 2,775 ft.
Interstate's No. 1 Nield, C NE, Sec. 18, Blk. 44, H.&T. C. Sur. ..... Rig up.
Magnolia Pet. Co.'s No. 1 Neild, 330 ft. from S and E of N½, Sec. 361, Blk. 44, H.&T.C. Sur. ..... Rigging up rotary.
Pollard et al's No. 1 Hall, 330 ft. S and E, NE, Sec. 131, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Sunray Oil Co.'s No. 2 Jones, 330 ft. N and W, W½ SW, Sec. 164, Blk. 3-T, T.&N.O. Sur. ..... Rig on ground.
Texas Interstate P. L. Co.'s No. 1-23 Thompson, C N½ NE, Sec. 23, Blk. 44, H.&T.C. Sur. ..... Location.
Texas Interstate P. L. Co.'s No. 1-37 Sneed, C NW, Sec. 37, Blk. 6-T, T.&N.O. Sur. ..... Location.
Texas Interstate P. L. Co.'s No. 1 Coon, 2,025 ft. from N and 2,640 ft. from W, Sec. 149, Blk. 44, H.&T.C. Sur. ..... Top gas 2,775 ft; gas at 3,070 ft.; S.D. 3,165 ft.
Texhoma Natural Gas Co.'s No. 2 Coon, center of Sec., Sec. 151, Blk. 44, Sur. ..... Drlg. 670 ft.
Texhoma Nat. Gas Co.'s No. 1 Coon-Sneed, center Sec. 8, Blk. 6-T, T.&N.O. Sur. ..... Top gas 2,585 ft; S.D. 3,211 ft. 9,000,000 ft. gas.

MOTLEY COUNTY

Matador Oil Corp.'s No. 1 Owens, C NE. Sec. 10, Blk. G, B.&B. Sur. ..... S.D. 530 ft.

OLDHAM COUNTY

Amalgamated German-American Oil Corp.'s No. 1 Norton, 330 ft. S and E, Sec. 12, T.&N.O. Sur. ..... S.D. 400 ft.
Chambers et al's No. 1 Herring, CNL, Sec. 20, Blk. S, G.C.&S.F. Sur. ..... S.D. 2,945 ft.

PARMER COUNTY

Magnolia Pet. Co.'s No. 1 Wilson, 330 ft. from N and W of SE, Sec. 73, H. Kelly Sur. ..... Drlg. 960 ft.

ROBERTS COUNTY

Chicken Creek Oil Co.'s No. 1 Ledrick, 330 ft. N and W, Sec. 55, Blk. C, G.&M. Sur. ..... Standardizing 2,466 ft.
Travis et al's No. 1 Cunningham, 330 ft. S and W, Sec. 74, Blk. M-2, H.&G.N. Sur. ..... S.D. 2,690 ft.

WHEELER COUNTY

Clarity et al's No. 1 Porter, 330 ft. S and W, SE, Sec. 2, Blk. A-9, H.&G.N. Sur. ..... S.D. for 6-in. csg. 2,150 ft.

EAST CENTRAL TEXAS WILDCATS

(Continued from Page 25)

GREGG COUNTY

Arkansas Fuel Oil Co.'s No. 1 F. T. Rembert, 330 ft. from S and W lines of 166-ac. tract and 83-ac. lease, John Ruddle Sur. ..... Drlg. 1,422 ft.
Artic Petroleum Co.'s No. 1 King, 57 ft. S of most northerly NW cor. and 104 ft. E at right angles in 2-in. tract, Chisum Sur. ..... Washing in with oil.
Atlantic Oil & Prod. Co.'s No. 1 M. B. Fisher, 1,415 ft. N of S line, 500 ft. W of E line of creek, W. H. Castleberry Sur. ..... Location.
Atlantic Oil & Prod. Co.'s No. 1 Turner estate, 893 ft. from N line and 1,857 ft. from E line of lease and survey, W. C. Wakeland Sur. ..... T.D. 2,600 ft.
Ausley and Massingill's No. 1 A. Harris, center of 3-ac. tract, Gladewater Townsite, M. Dillard Sur. ..... Drlg. 60 ft.
Bialock and Hensley's No. 1 Tom Hensley, center of west 6 acres of 12-ac. tract, John Ruddle Sur. ..... Derrick.
Bond et al's No. 1 J. R. Fenton, 360 ft. from S line and 252 ft. from E line of 20-ac. of west 30 acres, D. Sanches Sur. ..... Waiting on cmt. to set 3,540 ft.
Brannon et al's No. 1 W. A. Horton, center of 2-ac. lease, John Ruddle Sur. ..... T.D. 3,473 ft.
Buchanan et al's No. 1 George Ritchie, 120 ft. N and 15 ft. W of Monzell and Currie's No. 1 Church Block No. 4, M. Dillard Sur. ..... Derrick.
Bramlette's No. 1 Goforth, 170 ft. due N of NW cor. of Sun-Hilburn-Lloyd lease in Chisum Sur. ..... Rig up and S.D.
Bob et al's No. 1 T. L. Broy, 290 ft. from E and 1,640 ft. from S of H. A. Holdt Sur. ..... Derrick.
M. T. Beeler's No. 1 Finley and Thomas, 150 ft. from N and 150 ft. from W of 10-ac. lease, C. H. Alexander Sur. ..... Derrick.
Branson et al's No. 1 J. J. Fuller, 1,050 ft. from N and 170 ft. from W of survey, M. Alexander Sur. .... Derrick.
Byrd-Frost Oil Co.'s No. 1 Alexander and Strong, 330 ft. from S and E lines of 26-ac. tract, M. Tennison Sur. ..... Location.
Columbia Oil & Gas Co.'s No. 1-A Harley, 650 ft. E and 300 ft. S of SE cor. of Laura Walker 45-ac. tract, William Robinson Sur. ..... Drlg. 2,595 ft.
Danciger and Mahanan's No. 1 M. Christian, center of 6.39-ac. lease of north end of Mary Christian 196.-ac. tract, H. Hathaway Sur. ..... Rig up.
Empire Gas & Fuel Co.'s No. 1 J. C. Bumpass, 330 ft. S along road from NW cor. and 330 ft. E of W line of lease, W. H. Castleberry Sur. ..... Derrick.
Empire Gas & Fuel Oil Co.'s No. 1 H. A. Lockhart, 330 ft. from W line, 350 ft. from S line of lease, M. Tennison Sur. ..... Derrick.
Everett et al's No. 1 Barton, center Blk. 6, Mary Van Winkle Sur. ..... Drlg. 3,375 ft.
F. H. E. Oil Co.'s No. 1 R. Christian, 990 ft. from S line, 330 ft. from E line of 60-ac. tract, G. W. Hooper Sur. ..... Derrick.
E. E. Fogleson's No. 1 J. B. Doley, 150 ft. from S line and 460 ft. from W line of tract, W. M. Castleberry Sur. ..... Drlg. 2,787 ft.
Fox-Wood's No. 1 E. L. Walker, center of Blk. 1, M. Dillard Sur. ..... Location.
Lewis Godlin's No. 1 E. L. Walker, 330 ft. N of road, 330 ft. from E line of 80.2-ac. tract, M. Dillard Sur. .. Derrick.
Gulf Prod. Co.'s No. 1 C. Strong, 350 ft. from N line, 330 ft. from E line of 137-ac. tract, Joseph Hay Sur. ..... Location.
Harris et al's No. 1 J. E. Demoss, center of 1.5-ac. tract, H. R. Holdt Sur. ..... Spudded.
Humble Oil & Refining Co.'s No. 1 H. M. Lawrence, 540 ft. from N and 219 ft. from W of 100-ac. tract, David Ferguson Sur. ..... Derrick.
J. O. Hodges et al's No. 1 G. W. Ritchie, center of S 5 acres of N 10 acres of E 20 acres of Ritchie 40-ac. tract, Wm. Carlton Sur. ..... S.D. 1,300 ft.
D. L. Hoffman's No. 1 Bumpass, 360 ft. from S line and 360 ft. from W line of 10-ac. lease, W. H. Castleberry Sur. ..... Set 10-in. csg. 90 ft.
B. K. Isaac's No. 1 J. A. Tuttle, center of 4.5-ac. tract, H. Hathaway Sur. ..... Location.
K. B. Oil Co.'s No. 1 Dickson, 150 ft. from S and 150 ft. from W of 5-ac. lease, Mary Van Winkle Sur. S.D. 700 ft.
M. E. Gaskitt's No. 1 J. A. Godfrey, 220 ft. from S line, 150 ft. from W line of 4.25-ac. lease, M. Dillard Sur. .. Set 6⅝-in. csg. 3,560 ft.
Magnolia Pet. Co.'s No. 1 Foster, 330 ft. from W line and center of N and S lines of 29-ac. lease, W. G. Painter Sur. ..... Location.
Magnolia Pet. Co.'s No. 1 A. Hicks, 330 ft. from S line, 760 ft. from E line SE cor. of 98-ac. lease, D. Drainwood Sur. ..... Rigging up.
Mansell et al's No. 1 E. L. Walker, center Blk. 54, M. Dillard Sur. ..... Rig up.
E. G. Moren's No. 1 C. J. Dollahite, center of W 10 acres of 60-ac. tract, D. Sanches Sur. ..... Location.
Morgan and McMinn's No. 1 H. L. Foster, 150 ft. W, 15 ft. N SW cor. Magnolia Foster lease, Wm. Painter Sur. ..... Rigging up.
Pace Pet. Co.'s No. 1 Crim-Reynolds, Blk. 136, Kilgore Townsite, Mary Van Winkle Sur. ..... Rig up.
Peterson et al's No. 1 Geo. Ritchie, 60 ft. from NE line, 60 ft. from S line of Blk. 3, M. Dillard Sur. ..... Derrick.
Phillips and Lee's No. 1 W. E. Bumpass, 250 ft. N of S. D. Spratt's No. 1 Bumpass, L. G. Risby Sur. .... Rig up.
Rose et al's No. 1, located on Findley & Thomas 50-ac. tract, 150 ft. from S line of 6.66-ac. lease, C. H. Alexander Sur. ..... Derrick.

A LIFT
WHERE THE LOAD GETS HEAVIEST

1. A BALANCED UNIT. By utilizing weight of rods below Booster Pump to displace fluid on downward stroke, rods are always under tension, as in upward stroke. Shock-absorbing result makes pump a well-balanced unit.

2. INCREASES LIFE OF RODS. Continuous stretching and contracting of rods, which cause practically all rod troubles, have been reduced to a minimum by keeping rods under constant tension on both downward and upward strokes.

3. INCREASES PRODUCTION. Downward stroke as well as upward stroke, is made to lift oil. Rod tension on downward stroke acts as shock absorber, avoiding quick load stress at reversal of stroke. Length of stroke and number of strokes per minute may be increased materially, resulting in increased production.

4. INCREASES LIFE OF TUBING. Booster Pump provides tubing anchorage near center of string, reducing weaving motion and resultant wear. Constant rod tension also saves wear.

5. REDUCES WEIGHT OF WELL. Fluid is passed to casing above Booster Pump, relieving rods of this fluid weight, which is approximately 1½ pounds per foot in 2½" tubing. Booster Pump, being one-third of the way down, saves approximately 33⅓% in power consumed over the usual method of pumping.

THE GUIBERSON BOOSTER PUMP

Two-thirds of the way up, the Guiberson Booster Pump receives the fluid and hurries it speedily and easily to the surface.

The Guiberson Booster Pump is like an auxiliary working barrel. Oil delivered to it by the regular working barrel is transferred and lifted to the surface by means of the weight of the rods on the downward stroke. The enormous load from lifting the entire column of oil is thereby relieved. A deep well is transformed into a shallow well, for pumping. The five features at the left explain how this ingenious new Guiberson product both *saves* and *makes* you money.

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GUIBERSON
BETTER BE SAFE THAN SORRY

Sam P. Shelborn's No. 1 Dula Martin, 360 ft. S line, 990 ft. from E line of lease, W. P. Chisum Sur. ....Rig up.
Simplex Oil Co.'s No. 1 J. E. Lawther, 330 ft. from S line and 330 ft. from W line of 36.5-ac. lease, John Moffitt Sur. ....T.D. 3,589 ft.; lime.
Shell Pet. Corp.'s No. 1 Donnie Carr, 330 ft. from N and W line of 100-ac. tract, M. McCurry Sur.....Bldg. derrick.
Shell Pet. Corp.'s No. 1 A. A. King, 245 ft. from N line, 550 ft. from E line of lease, Geo. A. Thompson Sur...T.D. 3,548 ft.; reaming.
South American Drlg. Co.'s No. 1 D. R. Broone, 330 ft. from N and W lines of SE 40 acres of 425-ac. tract, Thomas Farmer Sur. ....Rig up.
Stanolind Oil & Gas Co.'s No. 1 Beulah Jones, 330 ft. S line and 378 ft. from E line of 100-ac. tract, G. W. Hooper Sur. ....Coring 3,613 ft.
C. R. Starnes' No. 1 G. C. Dunaway, center of Blk. 5, 115 ft. S, 475 ft. W SE cor. H. R. Hokit Sur.....Derrick.
Sun Oil Co.'s No. 1 Calvin Brown, 330 ft. from most southerly S line and middle of E and W lines of lease, L. B. Outlaw Sur. ....Derrick.
Shano Oil Co.'s No. 1 S. G. Smith, 162 ft. from N and S lines, 330 ft. from W line of 17-ac. lease, W. H. Castleberry Sur. ....Derrick.
Sun Oil Co.'s No. 1 J. E. Rollins, 1,492 ft. from N line, 1,492 ft. from S line, 589 ft. from W and E lines of 55-ac. lease, M. Scott Sur. ....Location.
Tom C. Patten's No. 1 George Walter, center of 1-ac. tract and 396 ft. from W line of lease, Mary Van Winkle Sur. ....Location.
Tidal Oil Co.'s No. 1 Lake Divernia Fish and Game Club, 300 ft. from N and 550 ft. from W lines of tract in William G. Painter Sur. ....Drlg. 2,540 ft.
Valentine Oil Co.'s No. 1 Goyne-Hughey, 6,100 ft. from S and 6,800 ft. from W of survey, Mary Van Winkle Sur. ....Rigging up.

HENDERSON COUNTY

J. M. Roger's No. 1 M. N. Gussett, 150 ft. from N line, 1,000 ft. from W line of 103.5-ac. tract, L. D. Stover Sur. ....Spudded and shut down.
Seven Wells Corp.'s No. 1 Douglas, 767 ft. from N and 833 ft. from E of tract in K. H. Douglass Sur. ....Drlg. 4,150 ft.

HOPKINS COUNTY

Roark et al's No. 1 Taylor, 220 ft. from N and W lines of 80-ac. tract in the John Polk Sur.....S.D. 540 ft.

HOUSTON COUNTY

Apex Drlg. Co.'s No. 1 Thompson Bros., 250 ft. out of NW cor. of 200-ac. tract in John Shears Sur. ....T.D. 2,364 ft.
Ramsland and Ramsland's No. 1 Pennington, 750 varas W of E line and 500 varas from S line of survey on 136-ac. tract, Ramond LaGarza Sur. ....S.D. 1,692 ft.
C. T. McManus' No. 1 Harron, 300 ft. out of NE cor. of 327-ac. tract, J. P. Procella Sur. ....Spudded and S.D. 37 ft.

HUNT COUNTY

Branson et al's No. 1 Gray ....Location.
Russell et al's No. 1 Brooks and Quattlebaum ....S.D. 1,455 ft.

LAMAR COUNTY

Indian States Oil Co.'s No. 1 W. T. Watson in Ignalius Aud Sur. ....S.D. 4,026 ft.
Puritan's No. 1 George Parr, 2,000 ft. from W of Frisco Railway and 1,000 ft. from E line of R. Russell Sur. ....Rigging up.

LEON COUNTY

Cooper et al's No. 1 Lynch, 4,000 ft. from W line and 250 ft. N from the S line of Thomas H. Gardner Sur., and in 200-ac. tract ....Drlg. 1,750 ft.
Sun Oil Co.'s No. 2 Grayson ....Drlg. 5,258 ft.

MORRIS COUNTY

Dumas et al's No. 1 Tom Ball, 1,046 ft. from E and 248 ft. from S of 71-ac. tract, A. S. Young heirs Sur. ....Derrick.

NACOGDOCHES COUNTY

Bunte et al's No. 1 A. F. Boatman, 330 ft. from S and 150 ft. from W of 67-ac. tract, William A. Moore Sur. ....S.D. 1,605 ft.
Churchill-Armstrong's No. 1 Max W. Hart, 2,040 ft. from N line and 2,640 ft. from S of N line of survey, George Pollett Sur. ....Derrick.
G. A. Teague's No. 1 Norris, 60 ft. NW of E line and 420 ft. S of road in 73.5-ac. tract, Homsea Y. Barbo Sur. ....Derrick.
Gainer et al's No. 1 Nicoe Well, 18 miles SE of Nacogdoches, 600 ft. from S and 150 ft. from W of Wells tract in A. Cherino Sur. ....S.D. 3,430 ft.
Joiner and Henson's No. 1 Andy Legg, 330 ft. from N and 330 ft. from W of tract, John Durst Sur. ....S.D. 2,920 ft.
Scully & Harwell's No. 1 R. I. Driver, 1,500 ft. from SE cor. of P. B. Ballard 125-ac. tract, 15 miles SE of Nacogdoches in Patricia De Torres Sur. ....Drlg. 3,231 ft.
Taylor-Vaughn's No. 1 Dixon Greer, 160 ft. from W and 450 ft. from N lines of 60-ac. tract in the M. G. Horrera Sur. ....S.D. 265 ft.
Creighton Drlg. Co.'s No. 1 J. N. Stewart, center of 79-ac. tract in the Jose Ignacio Ybarbo Sur. ....S.D. 3,226 ft.

RAINS COUNTY

C. H. Bayliss' No. 1 Ownby, 150 ft. N and 1,100 ft. from E of most easterly SE cor. of survey, Alexander Sur. ....Top Austin chalk 3,390 ft; base 3,512 ft.; S.D. 3,515 ft.

RED RIVER COUNTY

Doyle and Jondreau's No. 1 V. S. Griffin, 700 ft. from N line and 650 ft. E of W line of survey, J. C. Brown Sur. ....Slush pit.
Droppleman and Bundy's No. 1 J. W. Cunningham, 550 ft. from the S and 1,066 ft. from the E lines of B. M. Ballard Sur. ....Rig up.
Harris & Joiner's No. 1 E. Howison, 225 ft. S, 185 ft. W of 79-ac. tract, William Humphreys Sur. ....S.D. 1,940 ft.
Concord Oil Co.'s No. 1 J. R. Dellahunty, 500 ft. from N of Isaac Moore Sur. and 200 ft. E of E line of Robert Glass Sur. ....Drlg. 1,468 ft.

ROCKWALL COUNTY

Bucanner Oil Co.'s No. 1 H. L. Lofland, center of 69-ac. tract in W. M. Bird Sur. ....Set 10-in. csg. 120 ft.

RUSK COUNTY

Arnett-Adams and Keeling's No. 1 Mt. Comfort Church, 193 ft. N, 113 ft. W of SE cor. of 2-ac. tract, H. Hobson Sur. ....Location.
Barney Cockburn's No. 1 Nathan Green, 330 ft. from S and E line of lease, M. Busner Sur. ....Top sand 3,812 ft; T.D. 3,817 ft.
Chapman's No. 1 W. M. Futch, 330 ft. from N line and 500 ft. from E line of survey and lease, Jos English Sur. ....Set 10-in. csg. 228 ft.
F. C. Clark's No. 1 A. Johnson, center of 3-ac. lease, E. A. J. Evans Sur. ....Derrick.
Griffith Bros.' No. 1 S. E. Brox, 330 ft. from N and W lines of 30-ac. tract, Thomas Grace Sur. ....Drlg. 2,485 ft.
H. E. Hiden's No. 1 Varney, 100 ft. from N line, 125 ft. from E line of road, W. G. Tutt Sur. ....Derrick.
Humble Oil & Ref. Co.'s No. 1 Ben Peterson, 453 ft. from N line, 330 ft. from W line of N line and 330 ft. from W line of 50-ac. lease, J. Lewis Sur. ....Drlg. 1,600 ft.
Humble Oil & Ref. Co.'s No. 1 C. W. Wilson, 962 ft. from N line of Joe Williams tract, 400 ft. S. 156 ft. E of SW cor. of V. E. Reed tract, T. J. Martin Sur. ....Derrick.
H. L. Hunt's No. 1 R. J. Vinson, 990 ft. from N line, 330 ft. from W line of 55-ac. tract, Thos. H. Smith Sur. ....Derrick.
H. L. Hunt's No. 1 V. E. Reed, 330 ft. from N and W lines of 135-ac. tract, T. J. Martin Sur. ....Drlg. 2,652 ft.
Noel Rushing et al's No. 1 Geo. Thompson, 700 ft. from N line and 600 ft. from W line of lease and survey..Drlg. 2,850 ft.
Risinger et al's No. 1 L. Barton, 40 ft. S, 330 ft. W of Able and Avery's No. 1 Florey, W. G. Tutt Sur.....Drlg. 2,000 ft.
The Texas Company's No. 1 J. M. Price, 330 ft. from N line, 330 ft. from W line of 99-ac. lease, Thos. M. White Sur. ....Location.
Weaver and Crim's No. 1 Bean, 330 ft. from S line and midway between E and W lines of lease, H. Hobson Sur. ....Drlg. 1,670 ft.
Tex-Jersey Oil Corp.'s No. 1 G. W. Eaton, center of 1.54-ac. tract, F. Cordova Sur. ....Top sand 3,752 ft.; T.D. 3,760 ft.

JOINER POOL—RUSK COUNTY

Armstrong's No. 1 Alford, 151 ft. from S and 1,080 ft. from W of survey, T. J. Moore Sur. ....Derrick.
Duncan and Holt's No. 1 R. A. Motley, 150 ft. from N line, 2,700 ft. from W line of Motley 100-ac. tract, F. Cordova Sur. ....Drlg. 2,010 ft.
Humble Oil & Refining Co.'s No. 1 Moranda Joyner, 330 ft. from N and W lines of lease, F. Cordova Sur..Waiting on cmt. to set 3,753 ft.
Jackson et al's No. 1 P. C. Warren, 390 ft. from N line, 253 ft. from E line of 45-ac. tract, J. Womack Sur...Derrick.
M. & G. Oil Co.'s No. 1 Lewis Deguerin, 1,050 ft. from E line, 3,075 ft. from S line of survey, M. J. Pru Sur. ....Drlg. 3,560 ft.
Magnolia Pet. Co.'s No. 1 S. E. Brox, 330 ft. from N and W lines of most northerly NW cor. of 84.5-ac. lease, Geo. Cooper Sur. ....Rigging up.
Mass and Tucker's No. 1 Matthews, 3,244 ft. from N, 4,356 ft. from E. Dalines Cartimas Sur. ....S.D. 3,350 ft.
Paulett et al's No. 1 Ed Sparks, 350 ft. from E, 150 ft. from S of survey, L. C. Riggs Sur. ....Bailed dry after small show of gas; T.D. 1,313 ft.
Pitts et al's No. 1 Freeman, 1,000 ft. N of S line and 1,000 ft. E of W line of 181-ac. tract, J. Watkins Sur. ....Rig blew down.
Priest et al's No. 1 Mayfield, 155 ft. from N and W lines of 22-ac. lease in Daniel Clark Sur. ....Waiting on casing.
Sullivan & Burch et al's No. 1 F. J. Cox, 330 ft. from S line and 330 ft. from W line of tract, R. H. Penny Sur. ....Waiting on cmt. to set 3,566 ft.
W. W. Hinchliffee's No. 1 L. J. Pinkston, 330 ft. from E line and center of N and S lines of lease, J. B. Cadena Sur. ....Drlg. 3,520 ft.

SMITH COUNTY

Arcadia Ref. Co.'s No. 1 Wolford, center of 10-ac. tract, J. Jordan Sur. ....Location.
Bunte et al's No. 1 Atkinson, 1,000 ft. from S line and 1,000 ft. from N line of 330-ac. tract, Calloway Dean Sur. ....Derrick.
Cotton Belt Oil Co.'s No. C. S. Jackson, 500 ft. from N and 500 ft. from W of 39.88-ac. tract, Henry Mickleborough Sur. ....S.D. 4,038 ft.
Ignatius P. O'Neal's No. 1 Mayfield, 330 ft. from S line and N offset to Sinclair's No. 6-A Mayfield, James Jordan Sur. ....Location.
Tytex Oil Co.'s No. 1 Alex Weidert, 2,030 ft. from S line, 525 ft. from E line of Franklin T. Bodenheimer Sur. ....Derrick.

TITUS COUNTY

Perry V. Cook's No. 1 M. C. Rogers, center of SW of Moore Sur. ....S.D. 2,875 ft.
Joiner et al's No. 1 Clayton Brown, 1,800 ft. from E and 400 ft. from most northerly S line of V. Evans Sur...S.D. 2,250 ft.
J. P. Flannagan's No. 1 McGill, 450 ft. from S and 662 ft. from W of H. C. Riggs Sur. ....Drlg. 6,906 ft.

UPSHUR COUNTY

Harry V. Black's No. 1 J. M. Burrough, 330 ft. from S and W lines of 3-ac. tract, Wm. King Sur. ....Location.
Cal Petroleum Corp.'s No. 2 W. F. Glynn, 909 ft. from S line and center of E and W lines of tract, G. W. Hooper Sur. ....Waiting on cmt. to set 3,570 ft.
Calhoun et al's No. 1 J. R. Penn, 265 ft. from S line and E line of Penn 104-ac. tract, Joseph Manning Sur. ....S.D. 3,718 ft.
Cal Pet Corp.'s No. 1 W. H. Reed, 330 ft. from S and E line of 50-ac. lease, Marshall Mann Sur. ....Drlg. 1,600 ft.
E. L. Chapman's No. 1 D. F. Guest, 300 ft. out of NE cor. of Guest 129-ac. tract and survey ....Derrick.
Cranfill & Reynold's No. 1 Milton Rash, 1,687 ft. E of W line and 330 ft. N of S line of Rash estate, E. N. Eubanks Sur. ....T.D. 3,729 ft.; set 6⅝-in. csg.
Glasscock et al's No. 1 T. Wells, 250 ft. from N line of survey and 1,300 ft. from W line of farm on gin site tract, G. W. Hooper Sur. ....Drlg. 2,100 ft.
Galvey Oil Co.'s No. 1 W. W. Holland, 330 ft. from E line, 330 ft. NE of SW line of W 45 acres of Holland 246-5-ac. tract, T. Allen Sur. ....Drlg. 2,012 ft.
Humble Oil & Ref. Co.'s No. 1 A. L. Shelton, 581 ft. from N line, 561 ft. from S line, 350 ft. from W line of 29.8-ac. lease, D. Ferguson Sur. ....Location.
Humble Oil & Refining Co.'s No. 1 C. T. Shelton, 330 ft. from W line of S 59-ac. tract and 369 ft. from S line of survey, William King Sur. ....Derrick pattern.
Humble Oil & Ref. Co.'s No. 1 D. C. Shelton, 273 ft. from E of W line, 150 ft. N of S line of 19.5-ac. lease, Wm. King Sur. ....Derrick.
Shasta Oil Co.'s No. 1 E. E. Hall, 990 ft. from S line, 330 ft. from W line of 73.2-ac. tract, R. T. Gipson Sur. ....Drlg. 1,600 ft.
Shano Oil Co.'s No. 1 D. Rodden, 856 ft. from N and S lines, 544 ft. from W and E lines of W 40 acres of S 80 acres of 100-ac. tract, Marshall Mann Sur. ....Set 10-in. csg. 94 ft.
W. H. Peckam's No. 1 J. B. Well, 200 ft. N and 489 ft. W of SE cor. of W 20 acres of 71-ac. tract, G. W. Hooper Sur. ....Drlg. 3,445 ft.; base Pecan Gap 2,985 ft.
Wolf's No. 1 Cook, center of 115-ac. tract in Jacob Walker Sur., 5 miles W of Rosewood ....S.D. 1,100 ft.

VAN ZANDT COUNTY

Barton et al's No. 1 C. L. Hubbard, 600 ft. out of NE cor. of Hubbard 226-ac. tract, 3½ miles S of Canton, M. J. Cadena Sur. ....S.D. 2,000 ft.
Kelly Oil & Gas Co.'s No. 1 Lemsford, center of Lemsford tract, John Conner Sur. ....S.D. 2,300 ft.
Thomasson, Inc.'s No. 2 W. P. Forster, 600 ft. from N and 450 ft. from E of SW cor. of Forster 151-ac. tract in the F. Montgomery Sur. ....Drlg. 2,550 ft.
Pure Oil Co.'s No. 4 W. A. York, 890 ft. W of E line and 660 ft. S of N line of W. A. York 50-ac. tract, John Walling Sur. ....Set casing.
Van Oil Association's No. 1 Tankersley, 200 ft. from E and 1,000 ft. from S of farm, L. Landers Sur. ....Casing cemented.
Pure Oil Co.'s No. 1-T V. T. Davis, 400 ft. N of N line of Tunnell No. 8 lease, 480 ft. W of E line of Sur., Nacogdoches County School Land Sur. ....Cmtd. 9⅝-in. csg. 3,768 ft.
Pure Oil Co.'s No. 3 H. C. Gilbert, 856 ft. E of W line, 225 ft. N of S lines of lease, Mund Gross Sur. ....Drlg. 530 ft.
Pure Oil Co.'s No. 6 N. E. Clark, 696 ft. E of W line, 200 ft. S of N line of lease, Mund Gross Sur. ....Cement setting.
Pure Oil Co.'s No. 8 A. R. Tunnell, 741 ft. E of most westerly W line, 638 ft. N of S line of lease, John Walling Sur. ....Cement setting.
Sun Oil Co.'s No. 5 I. W. Thompson, 200 ft. S of N line, 250 ft. W of E line of lease, John Walling Sur...Drlg. 2,420 ft.
The Texas Company's No. 3, 792 ft. S of N line, 250 ft. E of W line of lease in Nacogdoches County School Land Sur. ....Location.

Brief Items for Petroleum Refiners

Consider Contract Basis for Jobber and Refiner Sales

With many contracts expiring during the next 60 days, consideration is being given to agreements between refiners and jobbers for 1932 covering gasoline requirements. On the part of refiners there is a disposition to get away from the wide guarantees which are a part of a large number of contracts now effective. In the Middle West and Mid-Continent many contracts now guarantee the jobber buyers a minimum of 5 cents between the delivered tank car price and the service station price exclusive of the gasoline tax and freight. Some of the guarantees are as high as 6½ cents per gallon.

It is recognized by buyers and sellers that these wide contracts have been a source of trouble contributing to the unsettled retail markets over the past year. Jobbers with the wide margins were able to undersell other jobbers and refiners with their own stations which were operating with margins in line with the actual cost of maintaining bulk stations and service station facilities.

A type of contract which is receiving considerable attention is based on 4½-cent minimum and 5½-cent maximum guarantees to the jobber by the refiner with the jobber buying on a published price quotation when the net tank car price was between two guarantees. In case the published spot market price is more than the 4½-cent guarantee the agreement provides that the refiner split the difference with the jobber. In case the published price is less than the 5½-cent maximum guarantee, the jobber splits the difference with the refiner.

Application of Contract

The workings of this contract are apparent from a study of its application on deliveries to Milwaukee. The present retail price in Milwaukee on the regular grade gasoline is 16.1 cents per gallon. This includes a 4-cent gasoline tax and a 2.61-cent freight rate from Oklahoma leaving a net retail price of 9.49 cents per gallon. With the tank car market of 4.25 cents in Oklahoma at this time the jobber would buy on the published market as this price is less than the net price of 4.99 cents with the minimum guarantee of 4.5 cents and more than the 3.99-cent price with the 5.5-cent maximum guarantee.

Should the published open market price drop to 3 cents, it would then be less than the 3.99-cent maximum guarantee. Under the contract the jobber and refiner would split the difference between 3 and 3.99 cents and the jobber would pay 3.49 cents f.o.b. refinery.

In case the published open market quotation advanced to 5½ cents then this price would be in excess of the 4.99-cent price allowed under the 4.5-cent minimum guarantee. Under this condition the difference would be split and the jobber would buy at 5.2 cents f.o.b. refinery.

This contract tends to prevent excessive spreads between tank car and retail prices and thus assures a fairer relationship between refiners and jobbers in their separate operations. Some of the contracts have special provisions. One contract offered by a refiner prohibits the jobber reselling any contract gasoline on the open market. This has been done over the past year in many cases when the contract price was favorable to the jobber in relation to the open market price. Some contracts also allow the jobber an additional one-fourth or one-half cent in handling a third grade gasoline.

A unique feature of some of the contracts provides that the refiner may cancel the contract when the tank car price is less than the posted price for 2 gallons of 36 gravity crude oil in the Mid-Continent.

NEW JERSEY STANDARD PERFECTS "SAFETY" FUEL FOR AIRPLANES

NEW YORK, Nov. 23.—Technicians of the Standard Oil Co. of New Jersey, one of the member companies of the Stanavo Specifications Board, Inc., have been investigating for some time past the possibilities of developing a "safety" fuel which would reduce the fire hazard in aircraft operation—in other words, a fuel of such low inflammability that in case of an airplane crash, the danger of fire from ignition of the fuel would be eliminated, it was learned at Stanavo headquarters here today.

The results of their research and experiments is a fuel whose flashpoint (that is, the temperature at which the fuel vapor will ignite) is 107° F., as compared with the flashpoint of ordinary gasoline which is anywhere from 28° F. to 46° F. This fuel has been undergoing tests for the past several months in the laboratories of the National Advisory Committee for Aeronautics at Langley Field, Virginia, where progress to date indicates that in addition to its obvious safety advantages, the new fuel possesses all the necessary operating characteristics of a high-grade aviation gasoline. In the first series of tests conducted by the N.A.C.A. engineers, an increase of power amounting to approximately 10 per cent was noted in their single cylinder test engine, with an appreciable drop in operating temperatures and every indication of efficient combustion.

The new safety fuel is produced by the hydrogenation process, with particular attention to high flash qualities, and has an octane number of 82.6 without the addition of any knock suppressor. The experiments made so far indicate that fuels produced by the hydrogenation process have inherent high antiknock value, a characteristic of greatest importance in fuels used for modern aviation engines.

Special Carburetor

Tests have demonstrated that the present methods of fuel injection used in the ordinary aircraft engine are not suitable for use with this type of fuel, and in order to derive full benefit from it a special carburetor and induction system must be installed. The previous experience of the N.A.C.A. engineers in their intensive investigations on various types of induction systems and injection nozzles has enabled them to adapt their results to the new fuel with gratifying success. A quantity of the special safety fuel has been made available to them by the Standard Oil Co. of New Jersey for further exhaustive tests.

Similar research has been going on in Europe, where a Mr. Ferrier of France has developed a grade of petrol comparable in many respects to the Stanavo safety fuel, but requiring the addition of tetraethyl lead to suppress its detonation tendencies. The Ferrier fuel is now being tested under actual flight conditions by the Air Union of France, and so far has given every indication of being satisfactory.

NEW REFINING COMPANY

CHATHAM, Ontario, Nov. 20.—Announcement has been made of the incorporation of the Federated Oils & Refineries, Ltd., with head office at St. John, New Brunswick, and executive board at Calgary, Alberta. The company, headed by Major W. A. Beckett of St. John, New Brunswick, is planning to build a refinery near Calgary of between 1,500 and 2,000 bbls. daily capacity to process the crude naphtha and crude oil of independent operators in the Turner Valley Field. Operators are being asked to contract their output for a five-year period.

START CONSTRUCTION WORK

The Standard Oil Co. of Kansas has started work on improvements which will enlarge the cracking capacity of its Neodesha, Kans., refinery. A Holmes-Manley cracking unit is being rebuilt and a vapor phase cracking unit installed.

PETROLEUM FROM COAL

CHATHAM, Ontario, Nov. 21.—Experiments in the production of synthetic petroleum from Alberta coal have been completed by Dr. E. H. Boomer of the University of Alberta, who has reported the results to the Alberta Research Council. It is claimed that extensive deposits of Alberta coal have a high volatile content, making them suitable for petroleum production. Doctor Boomer reports that recovery of petroleum from low-grade Alberta coal by hydrogenation is feasible, but that petroleum would have to go to $2 a barrel before the project could be seriously considered. Samples of the coal used have been sent to Ottawa for analysis and examination.

ATLANTIC REFINING CO. ADDS 12 KNOWLES OVENS

The Atlantic Refining Co. will add 12 Knowles coking ovens to its plant in Philadelphia to produce a petroleum coke of unusually high fixed carbon. These will be built by the Brassert-Tidewater Development Corp., a subsidiary of the Tide Water Oil Co. and the H. A. Brassert & Co. of Chicago. The new units are expected to be completed by March 1, 1932. This addition brings the total number of Knowles units in operation and building to 31, of which 10 are in the Standard Oil Co. of California's plant at Richmond, Calif., 6 in the Tidal Refining Co.'s plant at Drumright, Okla., and 3 building in Mexico. The operation of the Knowles ovens at the Tidal Refining Co. plant was explained in The Oil and Gas Journal September 10, 1931, page 16.

SOVIET STARTS NEW PLANTS

NEW YORK, Nov. 22.—A new Soviet oil cracking plant has begun operations in the Baku oil region, according to advices received here. The new plant, which is of the Shukov-Kapelushnikov system, will produce aviation gasoline.

An asphalt plant to utilize oil by-products has also been completed in the Baku region. Its capacity will be 450,000 metric tons of asphalt per year. The first section of the plant, with annual capacity of 80,000 tons, will go into production shortly.

INSTALL RECOVERY SYSTEM

The National Refining Co. is installing a new gas recovery system at its Coffeyville, Kans., refinery. The new unit, which will take the place of equipment operated at the refinery for several years, will be completed about the first of the year.

NEW CALGARY REFINERY STARTS RUNNING CRUDE

CHATHAM, Ontario, Nov. 21.—Refining operations were commenced this week at South Manchester, a suburb of Calgary, by the Bell Refining Co. which recently completed a 1,000-bbl. plant. In refining, the vapor phase treating process will be utilized, and the plant is built to handle 75 per cent Turner Valley products with a blending of 25 per cent crude oil from southern fields. The Bell Refining Co. is capitalized at $100,000 with head office at Calgary, and the officers are: President, A. G. Spooner; vice president, R. J. Brown; managing director, Floyd G. Huff; directors, Clarence Snyder, Hal Morgan and Hiram Spooner; secretary-treasurer, George Barber. Mr. Huff was manager of the Regal Oil & Refining Co. which he founded, till last June, when he disposed of his interests to Frank P. Book of Detroit. Transportation of crude from Turner Valley will be handled by trucks while the Bell products will be marketed, primarily in Alberta, through garages and filling stations.

LOUISIANA PROPERTIES OF SINCLAIR ACQUIRED

New Orleans dispatches Tuesday of this week reported acquisition of properties of the Sinclair Oil Co. of Louisiana by the Tex-York Utilities Corp. of New York, which plans to open the Meraux refinery March 1.

The properties purchased include the Sinclair refinery and 2,700 acres of land with Riparian rights on the Mississippi River, and Lake Borgne, and three of the Sinclair Navigation Co.'s tankers.

Approximately $10,000,000 will be spent by Tex-York on a new pipe line between East Texas fields and Meraux, work to start shortly. Between now and March 1 a new 20,000-bbl. unit will be added to the refinery by the new owners, the report stated.

At Sinclair headquarters in New York it was said that the company had been negotiating with Tex-York, but consummation of the deal could not be confirmed.

START CANADIAN PLANT

The Bell Refining Co., Ltd., has started operating a small plant in South Manchester, south of the corporation limits of Calgary, Alberta. The company expects to process up to 1,000 bbls. daily of Turner Valley crude oil. A. G. Spooner of the Spooner Oils, Ltd., is president of the company and Floyd G. Humm, managing director.

MONTREAL REFINERY OPERATES

CHATHAM, Ontario, Nov. 21.—The new refinery of the British American Oil Co. at Montreal has now been in successful operation for several weeks. Capacity production of the plant is reported to be 215,000 gallons of gasoline plus by-products, some 315,000 gallons of crude per day being handled. Combined daily capacity of the company's Montreal and Toronto refineries is now placed at 350,000 gallons. The Montreal refinery cost approximately $2,000,000 and has a 90-acre site with storage capacity for 500,000 bbls. of crude oil and 500,000 bbls. of refined products. The crude is obtained from the southwestern states and especially from the East Texas Field.

Manufacture of Natural Gasoline

Disposal of Butane Problem of Refiner And Manufacturers

By B. F. Spigener
Columbian Gasoline Corp.*

The refiner is learning to dispose of the excess butane which he has at his plant. In times like the present, when fuel is cheap, and butane has a value of little more than one-half cent per gallon for refinery fuel, it would appear that the refiner would so balance his operation as to permit him to purchase such natural gasoline on the outside as would enable him to utilize greater volumes of his otherwise wasted butane. He can do this by buying partially debutanized natural gasoline, blending it with his own butane, and thereby receiving for that butane the same price as he receives for his regular refinery gasoline.

On most cases the saving in freight on the 25 to 35 per cent butane in regular AA gasoline would allow him to pay a reasonable premium to the natural gasoline manufacturers for the partially debutanized natural gasoline, and yet lay that material down at such a price, which, blended with his own butane, would show him a profit. In this connection I believe that a great deal of money can be made by the refiner who will purchase his natural gasoline requirements by the new specifications recently announced by the Natural Gasoline Association.

There are many problems common to both branches of the oil industry. The refiner is advanced in the cracking field, which the gasoline manufacturer is just approaching in his researches for a proper outlet for excess butane.

On the other hand the natural gasoline gasoline manufacturer is in the vanguard in problems of rectification. Both are interested in the product of the natural gasoline manufacturer. The refiner should absorb natural gasoline into his own fuel wherever possible and avoid its deviation into a product which would place it in a price competition with motor fuel itself with continuing disastrous results.

As has been said, the integrated company which produces natural gasoline can help stabilize the situation and bring the production in line with demand. It would appear to be only primer philosophy that the refiner will eventually pay no more for butane than the cost necessary to extract it from his refinery gases. These, of course, are the total cost including the value of the butane as a finished product for other purposes or its value as a raw material for other processes.

It does not appear that the refiner would not continue to purchase butane in the form of natural gasoline and sell it in competition with liquefied petroleum gas at a price below cost. Eventually the law of supply and demand will take care of any unsound practices. The economic pressure will tend to favor the situation in which butane will be first available from the natural gasoline industry rather than from the refinery, since it will become a waste product at the natural gasoline plants before it does at refineries, as it will have little or no value as a raw material in its present form.

Butane Supply

After extracting sufficient butane for his own motor fuel requirements, the excess product then will become a waste product of lower value to the refiner and must of necessity seek an outlet in the liquefied petroleum gas market or will be chemically changed into other products of a higher market value.

The continual increase in use of oil cracking processes by the refiner will compel the natural gasoline manufacturer to sell still more stable grades of natural gasoline which in turn will increase the supply of liquefied petroleum gases available from the natural gasoline industry.

The average motor fuel contains 0.3 per cent of propane and 4.7 per cent of butane. The average daily consumption of motor fuel amounted to approximately 45,000,000 gallons in 1930. This means that the motoring public last year daily consumed about 2,250,000 gallons of liquefied petroleum gases in its motor fuel. Statistics indicate that as a very conservative estimate there is a daily potential production of at least 13,000,000 gallons of liquefied petroleum gases from the natural gasoline industry.

Butane, which is a gas at atmospheric pressure and at temperatures higher than 26° F., finds its market in manufactured gas industry and in various other industries. This product is used as an enricher to increase the calorific value of certain gases as a means for meeting peak load situation, and as the sole base material for the manufacture of gas for small towns where the installation of the conventional type of gas plant would not be economically feasible.

Butane is also used extensively as a gaseous fuel in many and varied industrial heating operations. The superiority of this high-grade gaseous fuel is most fully realized where the consumption is large and where an economical, clear and easily controlled fuel is advantageous. In addition high efficiency of combustion is made possible by the uniformity and purity of the product. It is for this reason that the industrial use of butane has been receiving such rapid recognition. When used as an industrial gas it is of course in direct competition with the product of the manufactured gas industry. During the past few months several markets have entered this field. In some instances prices equal to that of natural gasoline or lower have been offered.

*Plant foremen's meeting.

KETTLEMAN HILLS RESTRICTIONS REDUCE CALIFORNIA PRODUCTION

LOS ANGELES, Calif., Nov. 21.—There has been a very decided drop in production of natural gasoline in California during the current year to date. This decline can be attributed in a large extent to curtailment work in the Kettleman Hills Field in Kings County. The killing of two large gas wells by the Kettleman Hills North Dome Association two months or so ago has substantially reduced the production of natural gasoline in the North Dome of Kettleman Hills. The two wells in question were producing approximately 75,000,000 feet of natural gas each per day, from which was recovered a total of about 150,000 gallons of natural gasoline per day. Subsequent completions in the deep Ochsner zone have made up part of this deficit, although wells producing in the deep sand show a smaller production of natural gas and a consequent smaller recovery of natural gasoline.

In addition to the killing of these two Elliott gas zone wells, the action of operators in restricting field production to a maximum of 60,000 bbls. per day has led to a smaller production of natural gasoline. The accompanying table indicates a definite declining trend in the production of both crude oil and natural gasoline in California during the current year to date. This downward trend, incidentally, is an artificial one, however, reflecting as it does stricter curtailment in flush fields and arbitrary adjustments in both the number of wells producing and the manner of production. The governing factors have been the efforts of operators to limit crude oil production to current requirements and the movement to eliminate waste of natural gas either by effecting a low gas-oil ratio or a complete suspension in production activities involving wells showing excessive ratios.

The decline in natural gasoline production from 1,527,745 bbls. in January, 1931, to 1,198,667 bbls. in September in the face of increased consumption during the winter months will probably lead to smaller off shore shipments of natural gasoline during the remainder of this year. Natural gasoline prices have shown a strengthening tendency during the past few weeks and higher prices appear probable. Marketers on the Pacific Coast are not faced with any serious shortage of natural gasoline at the beginning of the winter demand for this commodity but at the same time there is no great overproduction. If the Standard Oil Co. ultimately kills its two large gas wells in the north dome of Kettleman Hills the industry may anticipate a further reduction in natural gasoline production as these two wells are producing approximately 80,000 gallons per day.

PRODUCTION OF NATURAL GASOLINE IN CALIFORNIA

Year 1931—	Natural gas treated (m.c.f.)	California production (barrels) — Natural gasoline	Crude oil	Total supply
January	44,291,998	1,527,745	16,485,738	18,013,483
February	38,284,287	1,280,262	14,930,932	16,211,194
March	42,080,130	1,470,592	16,364,842	17,835,434
April	40,606,286	1,398,027	15,803,541	17,201,568
May	41,666,462	1,431,354	16,448,960	17,880,314
June	38,392,060	1,345,949	15,641,436	16,987,385
July	37,142,416	1,351,297	16,093,322	17,444,619
August	35,858,724	1,304,769	15,668,984	16,973,753
September	33,637,848	1,198,667	15,180,610	16,379,277
Total year to date	351,959,210	12,308,662	142,618,365	154,927,027

CHANGE COMPANY NAME

DETROIT, Mich., Nov. 21.—A change of corporate name from Philfuels Co. to Philgas Co. was announced today by G. G. Oberfell, president of the company, which is Phillips Petroleum's liquefied petroleum gas subsidiary.

"One division of our company deals direct with the public—marketing propane gas for homes beyond the gas lines under the trade name 'Philgas.' Hundreds of thousands of people have naturally called the organization 'Philgas company,' so we decided that it would be easier to change the name of our company than to attempt to get so many people to use the former corporate name," said Mr. Oberfell.

"There are no changes in financial interest, company policies, personnel, or location of offices," continued Mr. Oberfell, "just a new name for the same company."

Gulf Production Co. Now Building Plant In East Texas Field

The Gulf Production Co. is preparing to erect a straight compression, 5,000,000 feet capacity natural gasoline plant on one of its leases in the Overton area, Rusk County, the plant to be constructed for repressuring purposes on the company's leases when repressuring is deemed necessary. The company expects to recover about 3 gallons of stabilized gasoline per 1,000 feet of gas. Gasoline manufactured at the plant will be shipped out by tank car over the I.&G.N. Railroad from Overton.

Jack Vaughn, superintendent for the Gulf Production Co., Shreveport, will be in charge of construction of the plant. Engines and compressors will be shipped from Gypsy Oil Co. dismantled plants in Oklahoma. The Gypsy is an associate company of the Gulf Production Co. Six or seven twin type compressors will be installed. The gas gathering system has not been surveyed, but the company desires taking gas from the Joiner and Overton area where it has several hundred acres of proven leases. Outside leases will also be connected with the lines which will probably be 10 and 12-inch.

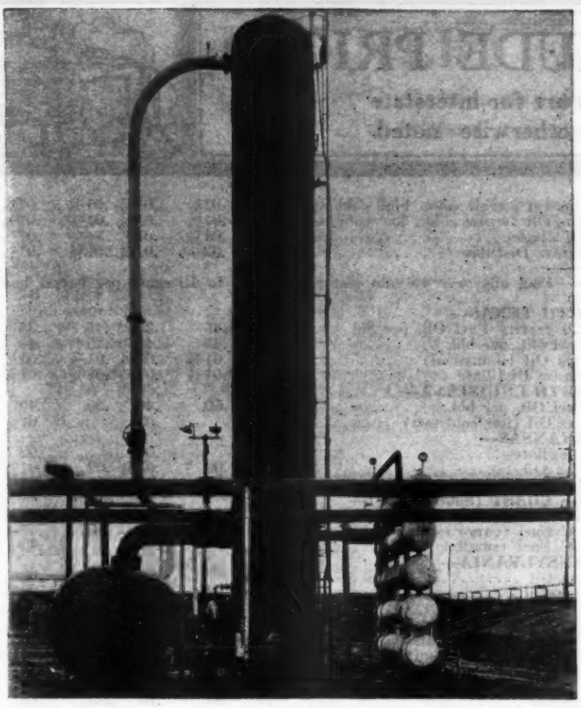
This will be the fourth natural gasoline plant to be constructed in East Texas, the Humble Oil & Refining Co. now having one in operation at Kilgore, and one in operation at London, the former having a capacity of 5,000,000 feet per day and the latter 10,000,000 feet per day. Neither of these plants is running to capacity. Each is making a little over 3 gallons per 1,000 feet of gas. The majority of the gas for these two lines is gathered in the Kilgore area. The Lisbon is constructing an eight-unit plant in the southern end of the Joiner Pool, Rusk County, and will take gas from the Mid-Kansas Oil & Gas Co.'s leases in that area. The other plant to be located here is that recently announced by George Ames and associates of the Cherokee Chief Oil Co. which will be located near Gladewater and will have a capacity of 4,000,000 feet daily.

EXPECT NEW RULING LOADING TANK CARS

The Bureau of Explosives is expected to permit a revision of the rules governing the maximum filling densities of tank cars of liquefied petroleum gas. The original request for the revision was made by the Shell Petroleum Corp. If the bureau publishes the revisions on the basis of the original proposal and tentatively as approved by the bureau, manufacturers of liquefied gas will be allowed to ship slightly more of their product per car in many instances.

The new table of proposed loading densities provides a greater flexibility by increasing the number of volume percentages for a given specific gravity range. Under the old method, a maximum of 45.5 per cent was permitted for liquefied gases ranging from .5 to .505. Under the proposal the loadings will be permitted as follows:

Specific gravity	Filling density
0.500	45.500
0.501	45.600
0.502	45.700
0.503	45.800
0.504	45.900
0.505	46.000
0.506	46.125
0.507	46.250
0.508	46.375



Maximum Heat Recovery with G-R Apparatus

THE illustration shows a typical gasoline recovery plant using G-R Heat Transfer Apparatus to assure greatest possible economy of heat and fuel.

The four G-R Vaneflo Exchangers which preheat the saturated rich mineral seal oil by means of the hot lean oil leaving the steam still, the G-R Oil Preheater in which steam imparts additional heat to the rich oil before it enters the still, and the G-R Kettle-type Reboiler, all help to conserve the heat in the system and to promote production of gasoline with minimum cost of operation and maintenance.

The special patented designs of G-R Apparatus provide definite advantages which have been demonstrated in hundreds of refineries, natural gasoline plants and pipe line pumping and compressor stations. Write for bulletins describing in detail the design and construction of G-R Heat Transfer Apparatus.

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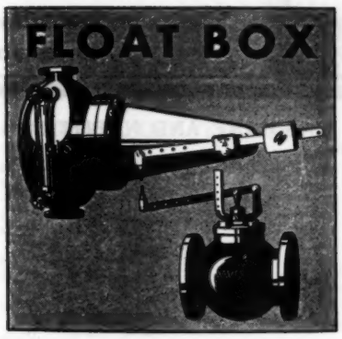

Dependable, accessible fluid level controls—

The Davis Float Box with balanced valve is specified by experienced engineers because of its simplicity, visible action, outside control, and the dependable service that goes with these features. It is used extensively on oil and gas separators and similar installations for control of fluid levels.

The entire mechanism is outside the tank, easy to install, accessible for hand testing, inspection and maintenance. The movable assembly is balanced by counterweight to handle oil of any gravity.

Remote control float boxes with valve located as far as 75 feet from the box are also made. They are used for relief or drain valves on absorption towers, oil stills, and similar equipment.

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REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

	Nov. 24		Nov. 17		Nov. 10	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.04	.04¼	.04¼		.04¼	
56-58 450 endpoint	.04	.04¼	.04½	.04¼	.04¼	
58-60 U. S. Motor	.04¼	.04¾	.04¾	.04¾	.04½	.04¾
60-62 430 endpoint	.04¼	.04¾	.04½	.04¾	.04½	.04¾
60-62 400 endpoint	.04⅜	.04⅞	.04½	.04⅞	.04⅝	.04⅞
64-66 375 endpoint	.04¾	.05	.05	.05¼	.05⅛	.05¼
68-70 360 endpoint	.04⅞	.05⅛	.05⅛	.05¼	.05¼	.05½
64-66 437 endpoint (blend)	.04	.04¼	.04¼	.04½	.04½	.04¾
NORTH TEXAS—						
50-52 450 endpoint	.04		.04⅛		.04¼	
58-60 450 endpoint	.03⅞	.04	.04		.04¼	
58-60 U. S. Motor	.04⅛	.04½	.04¼	.04½	.04⅜	.04½
60-62 400 endpoint	.04¼	.04½	.04⅜	.04½	.04½	
64-66 390 endpoint	.04½	.04⅝	.04¾	.04⅞	.04¾	.04⅞
64-66 375 endpoint	.04¾	.04⅞	.04⅞	.05⅛	.05	.05⅛
68-70 360 endpoint	.04⅞	.05	.05	.05¼	.05¼	.05¼
64-66 437 endpoint (blend)	.04		.04		.04¼	.04½
***NORTH LOUISIANA—**						
58-60 U. S. Motor	.04¾		.05		.05	
***ARKANSAS—**						
58-60 U. S. Motor	.04¾		.05		.05	
PENNSYLVANIA—						
52-54 Naphtha	.04¼		.04¼		.04¼	
54-56 Naphtha	.04¼	.04½	.04¼	.04½	.04¼	.04½
58-60 Gasoline	.04½	.04¾	.04½	.04¾	.04½	.04¾
60 Gasoline	.04¾	.05	.04¾	.05	.04¾	.05
62 Gasoline	.05	.05¼	.05	.05¼	.05	.05¼
64 Gasoline	.05¼	.05¾	.05¼	.05¾	.05¼	.05¾
68-70 350 endpoint gasoline	.05½	.06	.05½	.06	.05½	.06
CALIFORNIA—						
†54-58 U. S. Motor (domestic)	.05½	.06½	.05½	.06½	.05½	.06½
58-60 400 endpoint domestic gasoline	.06	.07¼	.06	.07¼	.06	.07¼
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	04	.04½	.04½	.04⅝	.04⅜	.04½
58-60 U. S. Motor	.04¼	.04⅜	.04⅝	.04⅝	.04½	.04¾
60-62 400 endpoint	.04⅜	.04⅝	.04⅝	.04⅞	.04¾	.05
64-66 375 endpoint	.04⅝	.05	.04⅞	.05⅛	.05	.05⅛
68-70 360 endpoint	.05	.05¼	.05¼	.05½	.05¼	.05½
64-66 437 endpoint (blend)	.04		.04½		.04½	
GULF COAST (Export)—						
58-60 U. S. Motor	.04½		.04½		.03⅞	.04
60-62 400 endpoint	.04⅝		.04⅝		.04¼	
61-63 390 endpoint	.04⅝		.04⅝		.04¼	
64-66 375 endpoint	.05		.05		.04½	

*Louisiana, Arkansas and Mississippi delivery. †For Pacific Coast consumption.

NATURAL GASOLINE

	Nov. 24		Nov. 17		Nov. 10	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.04¼	.04⅜	.04⅝		.04¾	.04⅞
Grade AA, 80-87.9, 375 e.p., rec. 90%	.03⅞	.04	.04⅜	.04½	.04½	.04¾
Grade B, 76-83.9, 375 e.p., rec. 85%	.03⅞	.04	.04⅜	.04½	.04½	.04¾
Grade BB, 84-92, 375 e.p., rec. 85%	.03⅝	.04	.04¼	.04⅝	.04½	.04¾
Grade C, 80-92, 375 e.p., rec. 78%	.03⅝	.04	.04¼	.04⅝	.04½	.04¾
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.04¼		.04½		.04⅝	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.03⅞	.04	.04⅝	.04½	.04½	.04⅝
Grade B, 76-83.9, 375 e.p., rec. 85%	.03⅞	.04	.04⅝	.04½	.04½	.04⅝
Grade BB, 84-92, 375 e.p., rec. 85%	.03⅞	.04	.04⅛	.04¼	.04¼	.04⅝
Grade C, 80-92, 375 e.p., rec. 78%	.03¾	.04	.04	.04¼	.04¼	.04⅝
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.04¼		.04⅝	.04¾	.04¾	
Grade BB, 84-92, 375 e.p., rec. 85%	.04		.04⅝	.04¾	.04¾	
Grade C, 80-92, 375 e.p., rec. 78%	.04		.04⅝	.04¾	.04¾	
CALIFORNIA—						
75-78 375 endpoint	.05¾	.06½	.05½	.06½	.05¼	.06½
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.04¼		.04⅝	.04¾	.04¾	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.04		.04⅜	.04½	.04½	
Grade BB, 84-92, 375 e.p., rec. 85%	.03¾	.04	.04⅜	.04½	.04½	

BURNING OIL

	Nov. 24		Nov. 17		Nov. 10	
OKLAHOMA (Group 3)—						
41-43 water white kerosene	.02⅛	.02¼	.02⅛	.02¼	.02⅛	.02¼
†42-44 water white kerosene	.02¼	.02⅜	.02¼	.02⅜	.02¼	.02⅜
NORTH TEXAS—						
41-43 water white kerosene	.02⅛		.02⅛		.02	.02⅛
40-41 water white kerosene	.02	.02⅛	.02		.02	
***NORTH LOUISIANA—**						
41-43 water white kerosene	.03		.03	.03¼	.02¾	.03
***ARKANSAS—**						
41-43 water white kerosene	.03		.03		.02¾	.03
PENNSYLVANIA—						
43 Kerosene prime white	.03½		.03½		.03½	
45 Kerosene water white	.03¾	.03¾	.03⅝	.03¾	.03⅝	.03¾
46 Kerosene water white	.03¾	.04	.03¾	.04	.03⅝	.04
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.04½	.05½	.04½	.05½	.04	.05
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white kerosene	.02¼	.02¼	.02¼	.02¼	.02¼	.02¼
42-44 water white kerosene	.02¼	.02½	.02¼	.02½	.02¼	.02½
GULF COAST (Export)—						
41-43 prime white	.04¼	.04½	.04¼	.04½	.03¾	
44 prime white	.04	.04¼	.04	.04¼	.03½	

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Price incorrectly quoted for 42-44 water white kerosene in November 19 issue for November 17.

FUEL OIL

	Nov. 24		Nov. 17		Nov. 10	
OKLAHOMA (Group 3)—						
Below 18 gravity Fuel Oil, per bbl.	.25	.30	.25	.30	.25	.30
18-22 Fuel Oil, per bbl.	.27½	.35	.30	.35	.30	.35
20-22 Fuel Oil, per bbl.	.30	.35	.32½	.37½	.32½	.37½
22-26 Fuel Oil, per bbl.	.35	.40	.35	.40	.35	.40
24-26 Fuel Oil, per bbl.	.40	.45	.40	.45	.40	.45
26-30 Fuel Oil, per bbl.	.45	.50	.45	.50	.45	.50
28-30 Fuel Oil, per bbl.	.50	.55	.50	.55	.50	.55
32-36 Gas Oil (industrial)	.01⅜	.01½	.01⅜	.01½	.01⅜	.01½
32-36 Gas Oil (straw color, high cold test)	.01¼	.01⅜	.01¼	.01⅜	.01¼	.01⅜
32-36 Gas Oil (straw color, low cold test)	.01⅜	.01¾	.01⅜	.01¾	.01⅜	.01¾
36-38 Distillate	.01¾	.01⅞	.01¾		.01¾	
38-40 Straw Distillate	.01¾	.02	.01¾	.01⅞	.01¾	.01⅞

Note—Fuel oils over 40 cold test generally 5 to 10 cents per barrel less when available.

NORTH TEXAS—						
Below 20 gravity Fuel Oil, per bbl.	.35	.45	.35	.45	.35	.45
24-26 Fuel Oil, per bbl.	.40	.45	.40	.45	.40	.45
32-36 Gas Oil (industrial)	.01¼	.01⅜	.01¼	.01⅜	.01¼	.01⅜
38-40 Straw Distillate	.01⅜	.01¾	.01⅜	.01¾	.01⅜	.01¾
***NORTH LOUISIANA—**						
18-20 Fuel Oil, per bbl.	.35	.50	.40	.50	.40	.50
30-32 Gas Oil (low cold test)	.02		.02		.02	
***ARKANSAS—**						
33-36 Distillate	.02		.02		.02	
30-32 Gas Oil	.01¾	.02	.01¾	.02	.01¾	.02
16-22 Refinery Fuel Oil, per bbl.	.35	.50	.35	.50	.35	.50
GULF COAST (South Texas)—						
Gas Oil	.02¼	.02½	.02¼	.02½	.02¼	.02½
Bunker C Fuel (cargo lots), per bbl.	.40	.45	.40	.45	.40	.45
Bunker C Fuel (small lots)	.45		.45		.45	
PENNSYLVANIA—						
30-34 Gas Oil	.02⅝		.02⅝		.02⅝	
36-40 Gas Oil	.02⅞	.02¾	.02⅞	.02¾	.02⅞	.02¾
CALIFORNIA—						
42-45 480 endpoint engine distillate	.07	.08	.07	.08	.07	.08
15-19 Fuel Oil, Bunker (at tidewater), bbl.	.60	.80	.60	.80	.60	.80
15-19 Fuel Oil, cargo lots (tidewater), bbl.	.55	.75	.55	.75	.55	.75
†15-19 Fuel Oil (f.o.b. tank cars), bbl.	.45	.75	.45	.75	.45	.75
27 plus Diesel, per bbl.	.80	.95	.80	.95	.80	.95
30-34 Gas Oil	.75	.95	.75	.95	.75	.95
CHICAGO DISTRICT (Based on Group 3)—						
18-22 Fuel Oil, per bbl.	.32½	.37½	.32½	.37½	.32½	.37½
22-26 Fuel Oil, per bbl.	.37½	.42½	.37½	.42½	.37½	.42½
28-30 Fuel Oil, per bbl. (zero)	.52½	.57½	.52½	.57½	.52½	.57½
32-36 Gas Oil (industrial)	.01⅜	.01¾	.01⅜	.01¾	.01⅜	.01¾
32-36 Gas Oil (zero)	.01⅞	.02⅛	.01⅞	.02⅛	.01¾	.02
38-40 Straw Distillate	.02	.02¼	.02	.02¼	.01⅞	.02⅛

*Louisiana, Arkansas, Mississippi and East Texas delivery. †Lowest priced fuel oil has high sulphur content.

LUBRICATING OIL AND WAX

	Nov. 24		Nov. 17		Nov. 10	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.04½	.04¾	.04½	.04¾	.04½	.04¾
100 vis., 3 color, 20-25 cold test	.04	.04½	.04	.04½	.04	.04½
150 vis., 3 color, 20-25 cold test	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
150 vis., 4 color, 20-25 cold test	.06¼	.06½	.06¼	.06½	.06¼	.06½
180 vis., 3 color, 23-28 cold test	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
180 vis., 4 color, 23-28 cold test	.07¾	.08¼	.07¾	.08¼	.07¾	.08¼
180 vis., 5 color, 23-28 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
200 vis., 3 color, 23-28 cold test	.09½	.10	.09½	.10	.09½	.10
200 vis., 4 color, 23-28 cold test	.09	.09¼	.09	.09½	.09	.09½
200 vis., 5 color, 23-28 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
240 vis., 3 color, 25-30 cold test	.11	.11¼	.11	.11¼	.11	.11¼
240 vis., 4 color, 25-30 cold test	.10¼	.10¾	.10¼	.10¾	.10¼	.10¾
240 vis., 5 color, 25-30 cold test	.09¾	.10	.09¾	.10	.09¾	.10
280 vis., 3 color, 25-30 cold test	.12½	.13	.12½	.13	.12½	.13
280 vis., 4 color, 25-30 cold test	.11½	.12	.11½	.12	.11½	.12
280 vis., 5 color, 25-30 cold test	.10¾	.11	.10¾	.11	.10¾	.11
Cylinder Stocks:						
600, steam refined, light green	.04½	.06	.04½	.06	.04½	.06
600, steam refined, dark green	.04	.05	.04	.05	.04	.05
190-200 vis., D color, Bright Stocks	.21	.22	.21	.22	.21	.22
150-160 vis., D color, Bright Stocks 0-10 c.t.	.19½	.20	.19½	.20	.19½	.20
150-160 vis., D color, Bright Stocks 10-25 c.t.	.19½		.19½		.19½	
150-160 vis., D color, Bright Stocks 25-40 c.t.	.19		.19		.19	
150-160 vis., E color, Bright Stocks	.18½	.19	.18½	.19	.18½	.19
Waxes:						
124-126 White Crude Scale Wax	.01⅝	.01⅞	.01⅝	.01⅞	.01⅝	.01⅞

All bright stock prices are for domestic movement.

PENNSYLVANIA—						
34 Neutral	.05½	.06½	.05½	.06½	.05½	.06½
34 Sundebloom	.05	.05½	.05	.05½	.05	.05½
36 Miners' Neutral	.05½		.05½		.05½	
150, 3 color	.16½	.17	.17	.17½	.17	.17½
180, 3 color	.19	.19½	.19	.19½	.19	.19½
200, 3 color	.21	.21½	.21	.21½	.21½	
220, 3 color	.23½	.25½	.23½	.26½	.24	.26½
600, steam refined	.13		.13¾		.13¾	
650, steam refined	.16	.16½	.16	.17½	.16½	
600, Pennsylvania Flash	.17	.18	.17	.19	.18	
600, E filtered	.17	.17½	.17	.17½	.17½	
600, D filtered, Oil City	.21	.23	.21	.23½	.23	.23½
Pennsylvania Bright Stocks below 35 c.t.	.22	.23	.22	.25	.24	.24½
Pennsylvania Bright Stocks above 35 c.t.	.21	.22	.21½	.23	.23½	.24
*122-124 White Crude Scale Wax	.02		.02		.02	
*124-126 White Crude Scale Wax	.02		.02		.02	

*At New York.

GULF COAST (South Texas)—						
100 vis., 2-2½ color, pale oil	.05½	.05¾	.05½	.05¾	.05½	.05¾
200 vis., 3 color, pale oil	.07½	.07⅝	.07½	.07⅝	.07½	.07⅝
300 vis., 3 color, pale oil	.08¾	.08⅞	.08¾	.08⅞	.08¾	.08⅞
500 vis., 3½ color, pale oil	.09⅞	.10⅛	.09⅞	.10⅛	.09⅞	.10⅛
750 vis., 3½ color, pale oil	.11⅜	.11⅞	.11⅜	.11⅞	.11⅜	.11⅞
1,200 vis., 3½ color, pale oil	.13⅞	.14⅜	.13⅞	.14⅜	.13⅞	.14⅜
2,000 vis., 4 color, pale oil	.14⅞	.15⅜	.14⅞	.15⅜	.14⅞	.15⅜
200 vis., 5-6 color, red oil	.06¾	.06⅞	.06¾	.06⅞	.06¾	.06⅞
300 vis., 5-6 color, red oil	.07⅞	.08⅜	.07⅞	.08⅜	.07⅞	.08⅜
500 vis., 5-6 color, red oil	.09½	.09⅝	.09½	.09⅝	.09½	.09⅝
1,200 vis., 5-6 color, red oil	.12⅞	.13⅜	.12⅞	.13⅜	.12⅞	.13⅜
2,000 vis., 6 plus color	.14⅞	.15⅜	.14⅞	.15⅜	.14⅞	.15⅜
CALIFORNIA—						
130 vis., 2½-3 color	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
200 vis., 2½-3 color	.09¼	.10¼	.09¼	.10¼	.09¼	.10¼

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

300 vis., 3-3½ color	.10¼	.11¼	.10¼	.11¼	.10¼	.11¼
350 vis., 3½-4 color	.11¼	.12	.11¼	.12	.11¼	.12
450 vis., 3½-4 color	.12	.12¾	.12	.12¾	.12	.12¾
550 vis., 3½-4 color	.12¾	.13¾	.12¾	.13¾	.12¾	.13¾
Red Neutral:						
200 vis., 4½-5 color	.09¾	.10¼	.09¾	.10¼	.09¾	.10¼
300 vis., 5-6 color	.10½	.11	.10½	.11	.10½	.11
500 vis., 4½-5 color	.12¾	.13½	.12¾	.13½	.12¾	.13½
600 vis., 6½ plus color	.13½	.14¼	.13½	.14¼	.13½	.14¼
700 vis., 6½ plus color	.14½	.15¼	.14½	.15¼	.14½	.15¼

Note—Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) EXPORT PRICES

	Nov. 24		Nov. 17		Nov. 10
Gaso. U.S.M., 58-60, 437 e.p., 65 O.N. (min.)	.06¼	.06½	.06¼	.06½	.06
Gaso., U.S.M., 58-60, 437 e.p., below 65 O.N.	.06		.06		.05½
Kerosene, water white, 41-43	.05½		.05½		.05½
*Fuel Oil, Bunker "C"	.70		.70		.70
†Fuel Oil, Diesel, 28-30, per bbl.	1.50		1.30		1.30
Gas Oil, 28 gravity plus	.04		.04		.04
25 pale Paraffin Oil, tank car	.10¼		.10¼		.10¼
28 pale Paraffin Oil, tank car	.07¼		.07¼		.07¼
280 red Paraffin Oil, tank car	.12½		.12½		.12½
250 red Paraffin Oil, tank car	.11½		.11½		.11½
225 red Paraffin Oil, tank car	.10		.10		.10
200 red Paraffin Oil, tank car	.09¼		.09¼		.09¼
Domestic heating oil, min. 32 grav., tank car	.03½		.03½		.03½
Refined Wax:					
120-122 a.m.p., per lb.	.02⅞		.02⅞		.02⅞
125-127 a.m.p., per lb.	.03		.03		.03
130-132 a.m.p., per lb.	.03½		.03½		.03½
133-135 a.m.p., per lb.	.04		.04		.04
135-137 a.m.p., per lb.	.04½		.04½		.04½
Petrolatum in barrels in carloads lots, per pound:					
Dark green	.01⅜		.01⅜		.01⅜
Amber	.02½		.02½		.02½
Extra amber	.03		.03		.03
Cream	.05½		.05½		.05½
Lily white	.06½		.06½		.06½
Snow white	.07		.07		.07

*Lighterage 5 cents a barrel extra. †Lighterage 6.5 cents a barrel. Correct price Nov. 17 and Nov. 10, $1.30.

NEW YORK (BAYONNE) REFINERY PRICES

	Nov. 24		Nov. 17		Nov. 10	
600, steam refined cylinder stocks, in bbls.	.21	.22	.21	.22	.21	.22
635, steam refined	.22½	.23	.22½	.23	.22½	.23
650, steam refined	.24	.24½	.24	.24½	.24	.24½
600, Pennsylvania Flash	.25	.26	.25	.26	.25	.26
630, Pennsylvania Flash	.28	.29	.28	.29	.28	.29
600, Warren E	.24	.24½	.24	.24½	.24	.24½
600, Oil City E	.23	.23½	.23	.23½	.23	.23½
Light 140-150 Bright Stocks	.32	.33	.32	.33	.32	.33
Dark 140-150 Bright Stocks	.31	.32	.31	.32	.31	.32

LOS ANGELES EXPORT PRICES

	Nov. 24		Nov. 17		Nov. 10	
Kerosene, water white	.04	.04¾	.04	.04¾	.04	.04¾
U. S. Motor gasoline, 53-55, 437 e.p.	.04¼	.04½	.04¼	.04½	.04¼	.04½
58-60, 400 endpoint gasoline	.04¾	.05	.04¾	.05	.04¾	.05

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

East Texas (Nov. 2, 1931)† ..... $ .83
Corsicana heavy (Nov. 2, 1931)* ..... .49
Other fields ..... See gravity table

†Posted by Panola Pipe Line Co., Magnolia Petroleum Co., Tidal Refining Co., Sinclair Refining Co., Gulf Pipe Line Co., Atlas Pipe Line Co. *Magnolia Petroleum Co.

EASTERN STATES
Joseph Seep Purchasing Agency
(Effective November 1, 1931)

Pennsylvania Grade Oil in National Transit Lines (Bradford Field) (Oct. 14, 1931) $2.00
Pennsylvania Grade Oil in Southwest Pennsylvania Lines 1.70
Penna Grade Oil in Eureka Pipe Line Lines (West Virginia) 1.60
Penna Grade Oil in Buckeye Pipe Line Lines (Sept. 4, 1931) 1.50
Corning Grade Oil in Buckeye Pipe Line Co.'s line (Nov. 9, 1931) ..... .85
Ragland Grade Oil in Cumberland Pipe Lines (Kentucky) (Jan. 10, 1931) .... .60
Wayne district Oil in Cumberland Pipe Lines (April 22, 1931) 1.17

Tide Water Pipe Co.
(Effective November 1, 1931)

Bradford, Pa. $2.00
Allegany, N. Y. 2.00

Pure Oil Co.
(Effective September 12, 1931)

Cabin Creek, W. Va. $1.60
Bradford Hollow, W. Va. 1.60
Kelly's Creek, W. Va. 1.60

Pennzoil Co.
(Effective October 8, 1931)

Pennsylvania Grade Oil in National Transit Lines:
Group A $1.95
Includes Cochran, Franklin, Hamilton and Doolittle districts.
Group B $1.94
Includes Titusville district.
Group C $1.93
Includes Turkey and Tidioute districts.
Group D $1.92
Includes Bear Creek and Porkey districts.
Group E $1.90
Includes Eldenau, Bull Creek, Rough Run, Carbon, Dipner, Bredin, McJunkin, Jameson, Kennerdell, Emlenton, Tiona, Lacy and Kinzua districts.
Price depends on length of pipe line haul to plant at Oil City.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties. See gravity table

WEST TEXAS

Iatan and Westbrook. Same as North Texas
Crane, Upton, Crockett, Howard, Glasscock, Ector, Winkler and Pecos Counties* ..... $ .50
Lea County, N. Mex.‡ ..... .50
Toborg, Pecos County, Aug. 25, 1931†.. .25

*The Texas Company, November 2, 1931; Magnolia Petroleum Co., Humble Oil & Refining Co., Gulf Pipe Line Co., same day. †Shell Petroleum Corp. ‡Humble Oil & Refining Co., The Texas Company, November 2, 1931.

GULF COAST

Grade A and Grade B classifications discontinued by leading buyers .....
..... See gravity table
Jennings, La. (Nov. 2, 1931)* ..... $ .65
Lockport, La. (Aug. 27, 1931)†.....
..... See Gulf Coast gravity table
Refugio light ..... See gravity table
Refugio heavy (Nov. 2, 1931)‡ ..... .75
Markham (Nov. 2, 1931)§ ..... .67
High Island (Nov. 2, 1931)¶ ..... .65

*Gulf Refining Co. †Vacuum Oil Co. ‡Humble Oil & Refining. §The Texas Company. ¶Gulf Pipe Line Co.

NORTH LOUISIANA AND ARKANSAS

Smackover, Ark. (all grades) (Nov. 4, 1931) ..... $ .55
Urbana, Ark. ..... See note below
Bellevue, La. (June 3, 1931) ..... $ .25
Urania, La. (Nov. 2, 1931) ..... .50
Calion, Ark. (Aug. 22, 1931) ..... .52
East El Dorado, Ark. (Nov. 4, 1931) .. .55
Stephens, Ark., below 29° (August 24, 1931) ..... .41

(Continued on Page 94)

CRUDE OIL GRAVITY TABLE

Gravity	Kansas and Oklahoma 1	North and Central Texas 2	East Central Texas 3	Gray County, Texas 4	Carson and Hutchinson Counties, Texas 5	Salt Creek, Wyoming 6	North Louisiana and Arkansas 7	Gulf Coast (Tex. and La.) 8
Below 25 degrees	....	....	....	....	....	....	....	$ .70
25-25.9 degrees	....	....	....	....	....	....	....	.71
26-26.9 degrees	....	....	....	....	....	....	....	.72
27-27.9 degrees	....	....	....	....	....	....	....	.73
28-28.9 degrees	....	....	....	....	....	....	....	.74
Below 29 degrees	$ .61	$ .61	$ .61	....	....	$ .61	$ .61	....
29-29.9 degrees	.63	.63	.63	....	....	.63	.63	.75
30-30.9 degrees	.65	.65	.65	....	....	.65	.65	.76
31-31.9 degrees	.67	.67	.67	....	....	.67	.67	.77
32-32.9 degrees	.69	.69	.69	....	....	.69	.69	.78
33-33.9 degrees	.71	.71	.71	....	....	.71	.71	.79
34-34.9 degrees	.73	.73	.73	$ .61	$ .66	.73	.73	.80
35-35.9 degrees	.75	.75	.75	.63	.68	.75	.75	.81
36-36.9 degrees	.77	.77	.77	.65	.70	.77	.77	.82
37-37.9 degrees	.79	.79	.79	.67	.72	.79	.79	.83
38-38.9 degrees	.81	.81	.81	.69	.74	.79	.79	.84
39-39.9 degrees	.83	.83	.82	.71	.76	.79	.79	.85
40 degrees and over	.85	.85	.85	.73	.78	.79	.79	.86

The Magnolia Petroleum Co., which pays a flat price in every field in which it purchases oil, posted the following price notice: "Effective November 2, 1931, at 7 a.m. and until further notice our prices on crude oil will be as follows at the wells: North and North Central Texas, which includes only Burkburnett, Archer, Stephens, Henrietta, Electra, Comanche and Olden, 83 cents; Central Texas, which includes only Mexia, Wortham, Corsicana light, Panola County and Lytton Springs, 79 cents; East Texas district, 83 cents; West Texas, which includes Winkler, Crane, Upton, Howard, Glasscock and Mitchell Counties, 50 cents; Panhandle district of Texas: Gray County, 73 cents; Carson and Hutchinson Counties, 66 cents; Southwest Texas: Mirando, 75 cents; Darst Creek, 60 cents; Corsicana heavy and Luling, 49 cents. Oklahoma: Cushing, Yale, Oklahoma City, Morrison, Wewoka, Seminole, 83 cents; Cement, Duncan and Walters, 75 cents; Hewitt and Graham, 67 cents; Healdton, 52 cents.

The Magnolia Petroleum Co. made the following announcement applying to North Louisiana and Arkansas: "Effective November 4, 1931, at 7 a.m., and until further notice our prices on crude oil in the States of Louisiana and Arkansas will be as follows per barrel at the wells: Louisiana—Bull Bayou, 83 cents; Haynesville, 65 cents; Pine Island, 73 cents; Cotton Valley, 61 cents. Arkansas—El Dorado, 63 cents; Rainbow, 63 cents; El Dorado East Field, 55 cents; Smackover, 55 cents.

The White Eagle Oil Corp., effective November 2, posted the following prices in Kansas: Group 1—Eastborough, Wright, Robbins, Greenwich, Lorena and North Greenwood Pools, 85 cents; Group 2—Eastman, Fox-Bush and Keighly, 83 cents; Group 3—Smock, Sluss, Leon-Weaver, Peabody and Rock, 81 cents; Group 3A—Ritz-Canton, 79 cents; Group 4—Urschell, Florence, Elbing, Nuttle-Koogler, 77 cents; Augusta, 77 cents; Group 5—Gelwick, 61 cents.

Column 1—Led by Continental Oil Co., effective November 2, and adopted by other purchasers on same day, excepting that the Carter Oil Co., Gypsy Oil Co. and Pure Oil Co. started their schedule at below 25 degrees, 53 cents; 25 degrees, 55 cents, with 2 cents added for each degree upward to 40 degrees and above at 85 cents.

Column 2—Led by Continental Oil Co., effective November 2, and followed on same day by other purchasers.

Column 3—Led by Humble Oil & Refining Co., effective November 2.

Column 4—Led by The Texas Company, November 2, followed by Humble Oil & Refining Co., Gulf Pipe Line Co. and H. F. Wilcox Oil & Gas Co. same day.

Column 5—Led by The Texas Company, November 2, followed on same day by Humble Oil & Refining Co. and Gulf Pipe Line Co.

Column 6—Mid West Refining Co., November 2.

Column 7—Standard Oil Co. of Louisiana, November 4, 1931; The Texas Company, Gulf Refining Co. and Louisiana Oil Refining Co. same day.

Column 8—Led by The Texas Company, followed on same day by Humble Oil & Refining Co., Vacuum Oil Co., Gulf Pipe Line Co. and Sun Oil Co., but two last named companies' schedules stop at 38 degrees and above at 81 cents, and the Sinclair Refining Co., but latter company's schedule stops at 31 degrees and above at 71 cents.

CALIFORNIA CRUDE OIL PRICES

STANDARD OIL CO. OF CALIFORNIA

For its current purchases of crude oil at the well (unless otherwise specified) the allowable crude oil produced in accordance with allocations made by the California Statewide Curtailment Committee. All gravities above those quoted take highest price offered in that field. Effective June 19, 1931, at 7 a.m.

Gravity	Signal Hill	Seal Beach, Alamitos Heights	Huntington Beach	Inglewood	Olinda-Brea Canon	Torrance	Richfield	Coyote Hills	Santa Fe Springs	Midway-Sunset, Elk Hills, Buena Vista Hills	Lost Hills
14-14.9	$ .65	$ .65	$ .65	$ .65	$ .65	$ .65	$ .65	$ .65	....	$ .55	$ .55
15-15.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55
16-16.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55
17-17.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55
18-18.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55
19-19.9	.65	.65	.65	.65	.65	.65	.65	.65	....	.55	.55
20-20.9	.65	.65	.65	.66	.66	.65	.65	.65	....	.55	.55
21-21.9	.65	.65	.65	.68	.67	.65	.66	.65	....	.55	.57
22-22.9	.66	.65	.66	.70	.68	.66	.68	.65	....	.56	.59
23-23.9	.67	.67	.68	.72	.70	.67	.70	.66	....	.58	.60
24-24.9	.69	.69	.70	.74	.72	.68	.72	.67	$ .65	.61	.62
25-25.9	.71	.71	.72	.76	.74	.70	.74	.69	.65	.64	.64
26-26.9	.73	.73	.74	....	.76	....	....	.71	.65	.66	.66
27-27.9	.75	.75	.76	....	.78	....	....	.73	.68	.68	.67
28-28.9	.77	....	....	....	.80	....	....	.75	.71	.71	.69
29-29.9	.79	....	....	....	....	....	....	.77	.73	.74	.71
30-30.9	.81	....	....	....	....	....	....	.79	.75	.76	.72
31-31.9	....	....	....	....	....	....	....	....	.78	....	....
32-32.9	....	....	....	....	....	....	....	....	.80	....	....
33-33.9	....	....	....	....	....	....	....	....	.82	....	....
34-34.9	....	....	....	....	....	....	....	....	.85	....	....
35-35.9	....	....	....	....	....	....	....	....	.87	....	....

Standard Oil Co. of California prices in other fields:

Wheeler Ridge—55 cents per barrel for all grades (14° to 35.9°).
Coalinga—55 cents for all grades from 14° to 24-24.9°; 57 cents for 25 gravity.
Newhall, McKittrick and Kern River—55 cents for all grades (14° to 19.9°).
Montebello—65 cents for all grades (14° to 25.9°).
Whittier and LaHabra—65 cents for all grades (14° to 22.9°).
Elwood Terrace, f.o.b. ship—32° to 33.9°, 79 cents; 34° to 34.9°, 81 cents; 35° to 35.9°, 84 cents; 36° and above, 87 cents.
Playa Del Rey—Prices subject to field gathering charge of 5 cents per barrel—19° to 19.9°, 65 cents; 20° to 20.9°, 65 cents; 21° to 21.9°, 66 cents; 22° to 22.9°, 67 cents; 23° to 23.9°, 68 cents; 24° to 24.9°, 67 cents; 25° and above, 68 cents.

(Continued on Page 103)

TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Nov. 24

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Chicago	15.0	15.0	3.0	9.0
Decatur, Ill.	15.4	15.4	3.0	9.0
E. St. Louis	14.7	14.7	3.0	8.2
Joliet	15.4	15.4	3.0	9.0
Peoria	15.4	15.4	3.0	9.0
Quincy	15.2	15.2	3.0	8.8
Davenport, Ia.	15.5	15.5	3.0	9.3
Des Moines	14.4	14.4	3.0	8.0
Keokuk	15.5	15.5	3.0	6.2
Sioux City	15.1	15.1	3.0	8.9
Duluth, Minn.	16.5	16.5	3.0	9.9
Mankato	16.1	16.1	3.0	8.0
Minneapolis	14.4	14.4	3.0	9.9
La Cross, Wis.	17.2	17.2	4.0	10.9
Milwaukee	16.1	16.1	4.0	8.9
Madison	16.3	16.3	4.0	9.1
Detroit, Mich.	14.5	14.5	3.0	10.7
Grand Rapids	15.7	15.7	3.0	10.6
Saginaw	15.9	15.9	3.0	10.8
Evansville, Ind.	16.1	16.1	4.0	9.9
Indianapolis	16.3	16.3	4.0	10.1
South Bend	16.4	16.4	4.0	8.0
Fargo, N. D.	17.9	17.9	3.0	11.9
Huron, S. D.	17.3	17.3	4.0	10.7
Sioux Falls	16.8	16.8	4.0	10.4
K. C., Mo.	14.9	14.9	3.0	7.6
Springfield*	14.9	14.9	3.0	8.5
St. Louis*	13.9	13.9	2.5	8.3
St. Joseph	10 4	10.4	3.0	7.5
Wichita, Kans.	13.8	13.8	3.0	7.8
Bartlesville, Ok.	14.0	16.0	5.0	7.0

*State tax 2 cents, remainder city tax.

A third grade of gasoline, "Stanolind Blue," is sold at all major points at a price 1½ cents or more below the price on the regular grade.

Effective November 4—New dump discount applicable on all grades of gasoline sold from tank wagon. Any tank wagon customer buying 25 gallons or more at one time will be given 1-cent discount per gallon off tank wagon price at time of delivery. Customers not under contract receive no other discount.

Effective April 15—Discounts on Q.D.A. on 1,000 gallons or more per month throughout territory; Red Crown Ethyl Gasoline, 2 cents off tank wagon price; Red Crown gasoline, 2½ cents off tank wagon price; Stanolind Blue gasoline, 1 cent off tank wagon price. On deliveries of 75,000 gallons or more each classification allowed 1 cent additional discount.

Discounts on resellers authorized agent's agreement: Same amounts as above except made off service station price instead of tank wagon price.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Dallas, Tex.	14.0	15 0	4 0	8 0
Fort Worth	14 0	15.0	4 0	7 0
Houston	13.0	15.0	4.0	8.0
San Antonio	13.0	15 0	4.0	7 0
El Paso	15 0	17.0	4.0	10 0
Texarkana	13 0	15 0	4.0	8 0
Muskogee, Okla.	10.0	12 0	5 0	5.0
Okla. City	14.0	16.0	5.0	7.0
Tulsa	14 0	16 0	5.0	8 0
Ft. Smith, Ark.	*16.5	17 0	5 0	*11.0
Little Rock	*17 5	17.0	6.0	*11.0

One-cent rebate made from posted station prices to cash purchasers in Louisiana, Arkansas and Tennessee.

*Less 3 cents to dealers.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Denver, Colo.	14.0	17 0	4.0	12.5
Pueblo	12.0	15.0	4.0	12.0
Grand Jctn.	18.0	21.0	4.0	14 5
Casper, Wyo.	16.0	18.0	4.0	10.0
Cheyenne	†15.0	15.0	4.0	11.5
Butte, Mont.	18.0	21.0	5.0	16.0
Billings	20 0	23.0	5.0	14.5
Great Falls	21.0	23.0	5.0	16.0
Helena	21.0	23.0	5.0	16.0
Salt Lake, Utah	17.5	20.5	4.0	16.0
Albu'que, N. M.	18.0	21.0	6.0	14.0
Boise, Idaho	20.5	23.5	5.0	18.0
Twin Falls*	20.5	20.0	5.0	18.0

*2½-cent discount off tank wagon to dealers.

†3-cent discount off tank wagon to dealers.

OHIO

Standard Oil Co. (Ohio)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Ohio points	15.0	16.0	4.0	*12.0

Dealers and commercial accounts 2 cents under tank wagon.

*Service station price 13 cents.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Omaha	14.9	15.9	4.0	9.25
McCook	17.0	17.0	4.0	7.5
Norfolk	16.75	17.75	4.0	9.75
N. Platte	17.75	18.75	4.0	10.50
Scottsbluff	17.0	17.0	4.0	9.0

Note—Dealers' discount allowed as follows: Red Crown Ethyl, 3 cents off station price; Red Crown, 2½ cents off normal service station price; Nebraska Blue (third grade), 1 cent off normal service station price.

PACIFIC COAST TERRITORY

	Gasoline Wh'l'e price	Gasoline Retail* price	Gasoline Incl'ds tax of	Kero. tank wagon
Fresno	19.5	16.5	3.0	17.0
San Francisco	19.5	16.5	3.0	15.5
Los Angeles	19.0	16.0	3.0	15.5
Reno, Nev.	23.5	20.5	4.0	19.0
Portland, Ore.	21.0	18.0	4.0	16.5
Seattle, Wash.	22.0	19.0	5.0	16.5
Tacoma	22.0	19.0	5.0	16.5
Spokane	25.5	22.5	6.0	20.5
Phoenix, Ariz.	15.5	17.0	5.0	20.0

Above prices are at company's plant or depots as company does not operate stations. A 6-cent per gallon discount is given dealers and customers taking tank wagon lots except in Phoenix where the discount is 3 cents plus a 3-cent special temporary discount subject to withdrawal at any time.

*Retail prices posted by Standard Stations, Inc., a subsidiary.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Albany, N. Y.	16.6	17.6	3.0	15.6
New York*	15.3	15.3	2.0	14.3
Buffalo	15.8	15.8	2.0	14.8
Rochester	16.0	16.0	2.0	14.0
Syracuse	16.8	16.8	2.0	14.8
Boston, Mass	16.5	16.5	3.0	13.5
Augusta, Me.	18.8	18.8	4.0	14.8
Manch'tr, N. H.	18.4	18.4	4.0	14.0
Burlington, Vt.	19.3	19.3	4.0	15.3

*Prices in steel barrels.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
N. Orleans, La.	14 5	14 5	6 0	12.0
Baton Rouge	16.5	17.0	5.0	12.0
Alexandria†	15.5	15.5	6.0	12.0
Lafayette*	17.5	18.0	6.0	12 0
Lake Charles*	14.0	14.0	6.0	12.0
Shreveport	16.5	17.0	5.0	12.0
Knoxville, Tenn.	20.0	20.5	6.0	13.5
Memphis	16.0	16.0	6.0	10 0
Chattanooga	19.5	20.0	6.0	12.0
Nashville	19.0	19.5	6.0	12.5
Bristol	18.0	19.0	6.0	14.0
Lt. Rock, Ark.	17.5	18.0	6.0	11.0

*Includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax. New Orleans kerosene price also includes 1-cent city tax.

†Gasoline price at Alexandria includes 1-cent tax in parish of Rapides.

Two-cent discount off gasoline and kerosene tank wagon price to dealer and commercial accounts.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	11.7	6.0
V.M.P. naphtha	13.7	7.5
Cleaners' naphtha	15.2	9.0
Stanisol	15.2	9.0

Tank wagon prices f.o.b. Chicago and Whiting, effective Nov. 6.

STANOLIND FURNACE OIL IN CHICAGO

Effective July 1, prices f.o.b. Chicago, tank wagon prices: 1 to 99 gallons, 8 cents; 100 gallons or more, 6 cents.

Stanolex Fuel

Effective May 9, f.o.b. Chicago, tank wagon prices: 1 to 199 gallons, 7 cents; 200 gallons or more, 5 cents. Sinclair met this by bringing down the price of its No. 3.

Fuel Oils

Chicago tank wagon prices (in lots of 400 gallons and over): 38-40 straw distillate, 6 cents; 32-36 gas oil (light zero), 5.5 cents; 32-36 gas oil (industrial), 5.25 cents; 28-30 zero fuel oil, 5 cents; 24-26 fuel oil, 4.25 cents; 18-22 fuel oil, 3.75 cents.

PENNSYLVANIA-DELAWARE AND PART OF NEW ENGLAND

Atlantic Refining Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Pittsburgh, Pa.	15.0	16.0	3.0	11.0
Philadelphia	13.0	14.0	3.0	11.0
Scranton	14.0	15.0	3.0	11.0
Allentown	14.0	15.0	3.0	11.0
Altoona	15.0	16.0	3.0	11.0
Erie	15.0	16.0	3.0	11.0
Dover, Del.	14.0	15.0	3.0	11.0
Wilmington	14.0	15.0	3.0	11.0
Springfd, Mass.	13.0	14.0	3.0	10.0
Worcester	14.3	15.3	3.0	10.0
Boston	13.5	14.5	3.0	10.0
Providence, R.I.	11.5	13.5	2.0	10.0
Hartford, Conn.	13.0	14.0	2.0	10.0
New Haven	14.6	15.6	2.0	10.0

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Atlanta, Ga.*	19.0	19.0	6.0	12.5
Augusta	20.0	21.0	6.0	14.0
Macon	20.0	20.0	6.0	12.0
Savannah	19.0	19.0	6.0	13.0
B'rm'ham, Ala.	18.0	18.0	6.0	13.0
Mobile	17.5	17.5	5.0	10.0
Montgomery	21.0	21.0	6.0	13.5
Jackson	16.0	16 0	5.5	11.5
Jack'ville, Fla.	20.0	21.0	7.0	12.0
Miami	21.0	22.0	7.0	13.0
Pensacola	21.0	22.0	7.0	13.0
Tampa	20.0	21.0	7.0	12.0
Lexington, Ky.	17.0	18.0	5.0	12.0
Covington	18.0	19.0	5.0	12.0
Louisville	16.0	17.0	5.0	11.0
Corbin	18.0	19.0	5.0	15.0

A third grade "Kyso Green," is sold at a price generally 2 cents below the price on the regular grade.

In addition to the state tax of 4 cents on gasoline, Montgomery has city and county tax of 2 cents on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. To Pensacola, Montgomery and Birmingham state taxes add 1-cent levy tax. To Gulfport state tax add privilege tax of 2 cents. To Mobile state tax add 1-cent city tax and 2½ cents county tax.

Effective April 2 price to dealers 2 cents under posted tank wagon price.

*An additional discount of 1 cent is offered to dealers here effective October 6.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'ds tax of	Kero. tank wagon
Atl'tic City, N.J.	15.2	16.2	3.0	11.5
Newark	14.2	15.2	3.0	10.5
Annapolis, Md.	15.7	16.7	4.0	11.0
Baltimore	14.9	15.9	4.0	8.5
Cumberland	16.7	17.7	4.0	12.0
Wash'gt'n, D.C.	13.4	14.4	2.0	10.7
Danville, Va.	17.5	18.5	5.0	11.8
Norfolk	16.0	17.0	5.0	10.3
Petersburg	17.0	18.0	5.0	11.3
Richmond	16.4	15.4	5.0	10.7
Roanoke	17.7	17.7	5.0	12.0
Charles'n, W.Va.	16.2	17.2	4.0	11.5
Keyser	16.8	17.8	4.0	12.1
Parkersburg	14.9	15.9	4.0	10.2
Wheeling	16.1	17.1	4.0	11.4
Charlotte, N. C.	17.0	18.0	6.0	10.7
Hickory	19.3	20.3	6.0	12.6
Mt. Airy	19.2	20.2	6.0	12.5
Raleigh	18.9	19.9	6.0	12.2
Salisbury	19.2	20.2	6.0	12.5
Charleston, S.C.	17.0	18.0	6.0	10.3
Columbia	18.9	19.9	6.0	12.2
Spartanburg	19.2	20.2	6.0	12.5

Two cents per gallon discount off retail tank wagon price of gasoline to dealers except Washington, D. C., and States of Maryland and New Jersey, where discount is 3 cents.

TANK WAGON CHANGES

Atlantic Refining Co. advanced the gasoline tank wagon and station prices in eastern Pennsylvania 1 cent November 23 with the exception of the station price in Philadelphia. On November 14 the gasoline tank wagon and station prices were reduced to 13 cents in Philadelphia.

Standard Oil Co. of Kentucky on November 16 advanced kerosene to 13 cents in Savannah, Ga., and advanced the gasoline tank wagon and station prices

(Continued on Page 102)

CRUDE OIL PRICES

(Continued from Page 93)

Stephens, Ark., 29° and above (August 24, 1931) ..... .44
Other fields ..... See gravity table

Note—Smackover, all grades, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co. Bellevue posted by Magnolia Petroleum Co. Urania by H. L. Hunt, Inc., and Louisiana Oil Refining Co.; Calion by Gulf Refining Co.; East El Dorado by Gulf Refining Co. and Magnolia Petroleum Co.; Stephens, Ark. by Louisiana Oil Refining Co. and Atlantic Oil Producing Co.

SOUTH CENTRAL AND SOUTHWEST TEXAS

Darst Creek (Nov. 2, 1931)‡ ..... $ .40
Luling (Nov. 2, 1931)† ..... .49
Mirando (Nov. 2, 1931)† ..... .75
Pettus (Nov. 2, 1931)* ..... .55
Salt Flat (Nov. 2, 1931)* ..... .40
Thrall§ ..... See gravity table
Lytton Springs (Lockhart) ..... See gravity table
Dobrowolski§ .....
Same as Mid-Continent gravity scale up to and including 38-38.9°.
Somerset§ .....
Same as Mid-Continent gravity scale up to and including 38-38.9°.

‡The Texas Company. *Humble Oil & Refining Co. †Magnolia Petroleum Co. §Thrall prices same as North Central Texas less 19½ cents per cwt. freight. ¶Grayburg Oil & Refining Co., Pioneer Oil & Refining Co. and Texas Petroleum Products. ||Pioneer Oil & Refining Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.

Iles, light (Aug. 24, 1931) ..... $ .75
Iles, heavy (Aug. 24, 1931) ..... .53
Fort Collins (Nov. 3, 1931) ..... .75
Florence (Nov. 2, 1931) ..... .85
Wellington (Nov. 3, 1931) ..... .61
Dutton Creek (Nov. 3, 1931) ..... .75
Rock Creek, Wyo. (Nov. 3, 1931) ..... .85
Frannie, light (Nov. 3, 1931) ..... .61
Frannie, heavy (Nov. 3, 1931) ..... .51
Salt Creek ..... Mid-Continent gravity table
Big Muddy (Nov. 3, 1931) ..... .33
Grass Creek (Nov. 3, 1931) 1.05
Elk Basin (Nov. 3, 1931) 1.05
Lance Creek (Aug. 24, 1931) 1.05
Poison Spider (Mar. 5, 1931) ..... .70
Notches (Mar. 14, 1927) ..... .65
Hudson (June 2, 1931) ..... .65
Lander (Mar. 5, 1931) ..... .40
Rex Lake (Feb. 22, 1930) 1.10
Osage (Apr. 15, 1931) ..... .93
Lost Soldier (Nov. 3, 1931) ..... .60
Hamilton Dome (Nov. 3, 1931) ..... .45
Greybull (Nov. 3, 1931) 1.05
Cat Creek (Nov. 3, 1931) 1.05
Pondera (Nov. 3, 1931) ..... .90
Sunburst, Mont. (Nov. 3, 1931) 1.00
Hogback, N. Mex. (Aug. 24, 1931) ..... .80
Lea County, N. Mex. (Nov. 3, 1931) ..... .50
Border, Mont. 1.55
Red Coulee, Alberta 1.55
Dry Creek, Mont. (Aug. 24, 1931) 1.00
Maljamar (Aug. 22, 1931) 1.00
Artesia-Jackson (Nov. 3, 1931) ..... .50

Note—Salt Creek, Cat Creek, Dry Creek, Dallas-Derby, Hudson, Greybull and Hogback posted by Midwest Refining Co. and remainder by Ohio Oil Co. Both companies posted Grass Creek light and Elk Basin. Lost Soldier posted by Producers and Refiners Corp. Artesia, Jackson and Maljamar posted by Continental Oil Co. Border and Red Coulee posted by Imperial Refining Co. Lea County posted by Humble Oil & Refining Co. Fort Collins, Wellington, Orchard, Florence, Rattlesnake and Table Mesa by the Continental Oil Co. Osage posted by Arro Oil & Refining Co.

MIDDLE WESTERN STATES

Ohio Oil Co.

(Effective November 3, 1931)

Lima $1.06
Wooster 1.15
Illinois ..... .96
Indiana ..... .86
Princeton ..... .91
Plymouth ..... Shut in
Western Kentucky ..... .90
Midland, Mich. (Oct. 9, 1931)* ..... .55
Dundee, Mich.† .....
Same as Stanolind Crude Oil Purchasing Co.'s Mid-Continent gravity scale
Upper and Lower Traverse Sands, Mich.† .....
Same as Mid-Continent gravity scale
Somerset, Ky. (Nov. 4, 1931) ..... .80
Hart County, Ky. (Nov. 1, 1931)§ ..... .60

*Posted by Pure Oil Co. †Posted by Standard of Indiana for boat shipment. §Posted by Stoll Refining Co. Somerset, Ky., crude purchased by Ashland Refining, Ashland, Ky., and delivered through its own pipe line.

MEXICO

Panuco* ..... $ .65

*F.o.b. ship, based on October transactions and exclusive of production and export taxes and bar dues.

CANADA

Ontario (Nov. 3, 1931):
Petrolia* $1.90
Oil Springs* 1.97
Alberta (Aug. 24, 1931):
Turner Valley:†
Crude oil 45-45.9 ..... 2.60
Crude oil 50 and above 2.65
Crude naphtha 2.13
Discolored naphtha 2.39

*Imperial Oil, Ltd. †Imperial Oil, Ltd. and Regal Oil & Refining Co.

Of Interest to Sales Departments

Fuel Systems in 1932 Automobiles To Be Redesigned

WASHINGTON, D. C., Nov. 21.—During the past year a survey has been made at the Bureau of Standards of the gasoline temperatures in the fuel feed systems of this year's automobiles in co-operation with the Society of Automotive Engineers, the National Automobile Chamber of Commerce and the American Petroleum Institute. Road tests at various speeds were made on 47 out of the 65 distinct models of 1931 cars on the market. These cars were made available to the bureau through the courtesy and co-operation of the local dealers in Washington.

It was found that in many of these cars sufficient precautions had not been taken by the manufacturer to prevent heat from the engine warming the gasoline in the fuel lines. Since excessive heating causes the gasoline to boil and stops the engine, the remedy for this difficulty lies in designing cooler fuel systems. The information obtained in this survey has been made available to the individual car manufacturers and there are indications that fuel systems in 1932 cars will be much cooler.

The road tests also gave information on the vapor pressure of the gasoline which can be used without boiling of the gasoline. If a gasoline has a high vapor pressure it boils readily, so if the refiner controls the vapor pressure he can keep trouble from boiling down to a minimum. The work of the bureau on 1931 cars tells how low the vapor pressure must be for satisfactory operation with these models. Of course, the vapor pressure cannot be made too low, otherwise there will be difficulty with engine starting in cold weather.

The automotive and petroleum industries are co-operating in solving the problem of engine stoppage due to gasoline boiling. The automotive engineer is attempting to keep the fuel lines cool; the petroleum refiner is controlling the vapor pressure of his product. The results of this co-operation will become more and more evident to motoring public during the coming year or two.

STANDARD COMPANIES TO SELL BATTERIES

The Standard Oil Co. of New Jersey and the Standard Oil Co. of Indiana will offer Atlas batteries for sale at certain of their stations beginning December 15. The batteries, bearing the name Atlas as do the tires sold by these companies, are a product of the USL Battery Corp., a subsidiary of the Electric Auto-Lite Co.

The Standard Oil Co. of Indiana will offer these batteries for sale at 50 of its stations in Chicago somewhat as an experiment. It will also offer recharging and rental services on batteries at 30 of its stations.

Colonial-Beavon Oil Co. and other subsidiaries of the Standard of New Jersey are likely to add batteries to their supplies of accessories offered for sale at their stations.

The Standard Oil Co. of California was the first of the Standard units to offer batteries for sale at its stations, the practice dating back to November 1.

PLAN ADVANCE IN QUEBEC TAX

NEW YORK, Nov. 23.—An increase of from 40 to 100 per cent in the present gasoline tax of 5 cents per gallon will be voted by the Quebec legislature at its present session, according to reports from Canada.

LARGE QUANTITY OF FUEL OIL USED TO PROTECT ORANGE CROP

The part oil plays in protecting Southern California's orange crops as told in the Texaco Star might be realized were 272 tank cars lined up loaded with fuel oil as representing just enough of a supply to feed the 3,120,600 heaters for one hour.

Next to oil, Southern California's largest industry is oranges, and in winter they are very often in danger of being frost bitten. Such a circumstance would at once remove the railroads' second largest tonnage out of Southern California, with a direct freight revenue of more than $25,000,000. It would impair the ability of the growers to meet their obligations to business with the $147,000,000 they receive for their crop. At the same time the danger of a freeze puts the oil man in a position to save the day.

Petroleum kept millions of California oranges from freezing to death last winter. During that season approximately 300,000 bbls. of oil and a lesser quantity of petroleum coke were burned in small orchard heaters to protect the citrus.

The typical orchard heater, as used in California orchards, consists of a base pot of sheet metal which holds from seven to nine gallons of fuel oil. A weather-proof lid covers the pot and in the center a stack of variable height is placed to allow the flames to pass upward and out. A small damper is placed at the edge of the lid to regulate the air flow, assisting the creation of a chimney draft. Some of the newer type burners have a draft ring placed around the base of the stack to assist combustion. However, with some low-grade fuels even these modern heaters produce soot after a short period of burning. The lighter ends burn off, leaving a heavy, tarry residue which cuts down heat throw-off materially. A recently perfected heater operates somewhat on the general principle of a kerosene stove. This secures the maximum heat from the oil without the formation of excessive soot and tarry matter.

The total number of heaters now in operation in the citrus belt requires 272 tank cars of fuel per hour. Of the total 223,523 acres of citrus in California, 62,412 acres are equipped with an average of 50 heaters to the acre, a total of 3,120,600 heaters.

The heaters are generally placed as close to the orange tree as possible, without danger of injury to the branches. They consume an average of one gallon of oil per hour. The heat liberated raises the temperature of an orchard from 8 to 10 degrees.

Suppose we look further into this cold weather business that last December caused oil men to load several special tank car trains of oil to run on a passenger schedule to save oranges in Tulare County when the thermometer suddenly dropped.

When the mercury falls to 28 degrees, the dead line is reached. In a section of mountains and valleys such as exists in Southern California, the contour makes for exceedingly spotty local temperature conditions. However, certain general factors influence the entire region.

There are two distinct causes of low temperatures: The movement of cold air currents from Alaska and western Canada southward into California; and the radiation of heat from the soil, especially when the ground is dry and a thin, dry air with a "high ceiling" prevails.

A high ceiling is due largely to high barometric pressures east of California. This results in dry, north-to-east winds, preventing an influx of moist air from the Pacific Ocean.

Regardless of temperature, the ability of oranges to withstand cold and the ease of keeping the temperature up to 28 degrees Fahrenheit depend on several conditions:

Fruit which has enjoyed a warm sun throughout the day and which is perfectly dry will stand considerable undercooling without being injured. At the same time a low ceiling makes for easy heating, while a high ceiling prevents the dissemination of heat into the grove.

While it is true that various types of orchard heaters will burn almost any type of fuel oil, the prevailing preference is for an oil of from 27 to 30 degrees A.P.I. gravity, having an asphalt residue of not more than 3 per cent and a low carbon and sulphur content. Due to the enormous amounts of soot formed during the combustion of low-grade fuels, and the failure in efficiency of orchard heaters after burning low-grade fuels for several hours, there is a strong movement afoot to enforce the use of high-grade oils which burn completely, or to enforce the use of heaters which will insure complete combustion of low-grade fuels with a minimum amount of soot formation.

The 154,599 acres of citrus not equipped with heaters represent a new business possibility, for much of this acreage is endangered from time to time by low temperatures.

As an example of how orchard heating pays, in orchards where an average of $90 per acre was spent in saving the crop there was a fruit sales return of from $277 to $684 per acre which would have resulted in a total loss without heating. Usually the grower can tell from his previous cost records, compared with the current cost of oil, whether he can fire 10 nights or 20 and still have a chance to break even.

Fuel oil storage to the amount of 49,710,866 gallons is provided at a number of private orchards and packing houses. This is usually enough to start emergency firing, which is always backed up by the full co-operation of the oil companies in emergency periods.

DISTILLATES TAKING PLACE OF KEROSENE

Kerosene is giving way to distillate and gasoline as a tractor fuel, according to consumption figures prepared by the Northwest Petroleum Association from tax returns on products consumed in Minnesota, North Dakota, South Dakota and Wisconsin. Because there is no tax on distillates in the Dakotas and in Wisconsin the relative change in its consumption cannot be shown but that for Minnesota is very definitely shown. In fact, the substantial decrease in the kerosene consumption in these states suggests there may have been an even greater proportion of distillate used because there is no tax on this fuel in these states.

The detailed figures showing the consumption of the three products during the first nine months of this year compared with that for the same period last year are shown below.

	First 9 months	
Minnesota—	1930	1931
Gasoline	305,075,666	339,602,976
Kerosene	29,825,627	23,431,898
Distillate	29,573,858	31,451,058
North Dakota*—		
Gasoline	98,049,582	93,399,844
Kerosene	13,553,308	6,687,369
South Dakota*—		
Gasoline	110,200,858	112,603,550
Kerosene	12,997,963	8,710,014
Wisconsin*—		
Gasoline	340,534,150	357,189,750
Kerosene	28,150,500	24,155,180

*Distillate is not subject to inspection in these states; figures are therefore not available.

SOVIET OFFERS CHILE GASOLINE FOR MINERALS

SANTIAGO, Chile, Nov. 21.—Russia has indicated a willingness to exchange oil products for Chile's copper, soda and nitrates, the plan for which the government is now considering.

Suggestions for the establishment of domestic refineries either by foreign oil companies now operating here or by a government constituted monopoly have been under discussion in Congress and the press for weeks, and the general opinion is that something must be done to cut down the costs of importing refined oil.

The conditions of the Russian proposal have not been disclosed, but the low prices offered and other advantages are believed likely to prove more acceptable than the establishment of refineries and at the same time would create an outlet for Chilean products. The Chilean government would have absolute control of the reception and distribution of Russian oil products and would be able to grant concessions for this purpose to Chilean companies.

A study of the proposal is reported to be well advanced by technical and legal advisers and it is believed an agreement will be reached soon.

Similar proposals, although not in such favorable terms, have been received from Rumanian companies.

At present Chile has no commercial relations with the Soviet government, but the Russian proposal has awakened deep interest, since it brings a possibility of improving international trade conditions and at the same time might displace American and British business, which hitherto has had no competition.

SOVIET WILL NOT SHIP OIL TO U. S.

NEW YORK, Nov. 21.—The Soviet is not planning any shipments of gasoline to the United States, according to Peter A. Bogdanov, chairman of the board of directors of the Amtorg Trading Corp.

Commenting on recent press reports wherein a shipment of Rumanian gasoline to Detroit was erroneously reported as having originated in Russia, Mr. Bogdanov says:

"The report purporting to have originated in Detroit to the effect that the Soviet Union is making a shipment of gasoline to Detroit is absolutely without foundation. No gasoline of Soviet production is being shipped to the United States, nor are any such shipments contemplated. Not only is the story incorrect, but seems to be absurd on the face of it, since it states that the first consignment of the oil in question was shipped from the port of Constanza in Rumania, with which country the Soviet Union maintains neither diplomatic nor commercial relations."

FEWER AIRPLANES MADE

Although airplanes consume a relatively small proportion of the output of gasoline and motor oils at present, their importance in this respect is gaining rapidly and the oil industry is offering every means of encouragement of its development. The production of planes during the first nine months of this year was below that for the same period a year ago, according to a survey prepared by the Department of Commerce. These craft included 1,583 manufactured for domestic civil use, 637 military deliveries and 101 exported to foreign countries.

The airplanes built for domestic civil use included 1,130 monoplanes, 399 biplanes, 52 autogiros and 2 helicopters.

Pipe Line Stocks Show More Activity

Heavier Volume of Crude Runs Indicates Increased Earnings This Year for Several Eastern Pipe Lines. Further Expansion Expected

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Nov. 23.—Increasing operations on the part of a number of eastern pipe line companies have been reflected in quickened interest in the securities of these companies, and a number of issues, including South West Pennsylvania Pipe Line Co., Eureka Pipe Line Co. and Southern Pipe Line, have been more active recently. Expanding operations on the part of National Transit Co., which is now moving more crude inland from the Atlantic Seaboard, are also coming in for closer attention marketwise.

A number of the eastern pipe lines in the so-called "Standard Oil group" have shown a subbstantial increase in operations this year, and this expansion is expected to continue. The added movement, it is believed, is due in large measure to the operation of Ajax Pipe Line by the Standard Oil Co. (New Jersey) which has materially stepped up the operations of affiliated companies redistributing in the East. Capacity of the Ajax line will be enlarged, it is reported, and this in turn should make for still greater volume on the part of several eastern lines.

Pipe line securities, as a group, have reflected fully the depression which has been so widespread in the stock market during the past year, and shares of a number of the leading companies are currently selling at the lowest levels recorded for many years back.

North Central Texas

North Central Texas Oil Co. reports for the September quarter net loss of $8,098 after taxes, depletion, property writeoffs, etc., compared with net loss of $1,915 in the previous quarter and net profit of $63,414 in the September quarter last year. Net loss for the nine months ended September 30 was $2,482 after the above charges, compared with net profit of $160,243 in the first nine months of 1930.

Galena-Valvoline

Galena Oil Corp. has notified stockholders that the sale of assets of the company in part to the Valvoline Oil Co. and in part to E. W. Edwards has now been consummated. In order to effect the distribution of the Valvoline Oil Co. shares acquired by the company, it will be necessary for stockholders to ratify and approve the consummation of the sale and to vote on a reduction of the company's capital stock to $12,000 to make possible distribution of the Valvoline shares, and this will be voted on at a special meeting of shareholders on December 1.

Cumberland Pipe

Stockholders of Cumberland Pipe Line Co. will vote formally at their annual meeting at Winchester, Va., on December 3, on winding up the company's affairs. Stockholders owning a majority of the capital stock have already given their consent in writing to this step.

Reduce Capital

Stockholders of Indian Refining Co. (subsidiary of The Texas Company) have approved a reduction in the authorized common stock from 2,000,000 to 1,275,000 shares. Retiring directors were reelected.

Ohio Oil

Ohio Oil Co. and subsidiaries report for the 12 months ended September 30 net loss of $1,618,132, after taxes, depreciation, depletion, etc. Consolidated income account for the 12 months period follows: Gross, $49,943,401; expenses, $41,586,984; balance, $8,356,417; other income (debit), $238,813; taxes, $1,928,924; depreciation and depletion $7,675,331; federal taxes for fourth quarter 1930, $131,481; net loss ,$1,618,132; preferred dividends, $3,456,531; common dividends, $4,953,480: deficit, $10,028,143.

Shell Mex & B.P.

Shell-Mex & B.P. Co., Ltd., with nominal capital of 100 shares of £1 par, has been registered in London. This is the new distributing company representing consolidation of the marketing operations in Great Britain by Anglo-Persian Oil Co. and Royal Dutch-Shell.

Prairie Pipe Line

Prairie Pipe Line Co. reports for the September quarter net profit of $342,000 against $1,315,300 in the previous quarter and $3,491,150 in the September quarter last year. This report was inadvertently attributed to Prairie Oil & Gas Co. November 19.

Lion Oil

Lion Oil Refining Co. reports for the September quarter net loss of $85,071 after interest, depreciation, depletion, etc., compared with net loss of $121,551 in the previous quarter. In the third quarter last year the company reported earnings of $227,029 after charges, but before depreciation, depletion, and federal taxes. For the first nine months of 1931 net loss was $400,119, after interest, depreciation, depletion, etc. For the corresponding months of 1930 the company reported profit of $891,097 before depreciation, depletion, and federal taxes.

Cities Service

The number of common stockholders of the Cities Service Co. increased 8,057 between October 15 and November 15, and exceeded 506,000 on the latter date, the company announces. The company also announced continued expansion in operations by its petroleum department, which for the first nine months of 1931 reported sales of 40 per cent in excess of those for the comparable months last year.

Texas Corp.

The Texas Corporation declared the regular quarterly dividend of 50 cents, payable January 1 to stock of record December 4.

Standard of New Jersey

Standard Oil Co. of New Jersey has called for retirement on February 1 of $30,000,000 of its outstanding issue of $120,000,000 of 20-year 5 per cent debentures. The bonds will be drawn by lot and under the terms of the issue will be redeemed at $102. In announcing the plan to call the bonds W. C. Teagle, president, said that one-quarter of the 20-year term having expired it was deemed wise at this time to reduce the funded indebtedness in that proportion.

The company will provide out of cash the funds to retire the called bonds, thereby effecting a reduction of $1,500,000 per annum in fixed charges.

Empire Gas & Fuel

Empire Gas & Fuel Co. has declared the regular monthly dividends of 66⅔ cents on the 8 per cent preferred, 58⅓ cents on the 7 per cent preferred, 54 1-6 cents on the 6½ per cent preferred and 50 cents on the 6 per cent preferred stocks, all payable December 1 to stock of record November 14.

Sun Oil

Sun Oil Co. has declared the regular quarterly dividends of 25 cents per share on the common, payable December 15 to stock of record November 25. The regular quarterly dividend of $1.50 per share on the preferred was also declared, payable December 1 to stock of record November 10. Stock dividends of 9 per cent were paid on the common in the closing quarters of 1930 and 1929.

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Wednesday, was as follows:

Mar. 18	26.78	July 22	21.33
Mar. 25	26.85	July 29	20.68
Apr. 1	24.39	Aug. 5	20.80
Apr. 8	25.52	Aug. 12	21.00
Apr. 15	24.72	Aug. 19	24.25
Apr. 22	22.73	Aug. 26	23.26
Apr. 29	20.54	Sept. 2	22.30
May 6	20.74	Sept. 9	20.28
May 13	20.38	Sept. 16	18.30
May 20	19.25	Sept. 23	17.64
May 27	18.35	Sept. 30	15.83
June 3	18.00	Oct. 7	15.86
June 10	19.62	Oct. 14	16.43
June 17	19.23	Oct. 21	17.58
June 24	22.33	Oct. 28	16.80
July 1	22.32	Nov. 4	18.86
July 8	21.34	Nov. 11	18.76
July 15	19.79	Nov. 18	17.60

Royal Dutch-Shell

Pending additional data on profits for the year, and a clearer outlook for the oil industry, directors of the Royal Dutch Co. and Shell Transportation & Trading Co., Ltd., have decided to postpone action on the interim dividends on their respective stocks. In previous years, the two companies have declared an interim dividend of 10 per cent on their respective stocks in November.

Shell Pipe Line

Shell Pipe Line Corp. reports a balance after federal taxes of $3,403,578 for the third quarter of 1931, compared with $3,726,448 for the corresponding quarter last year. Surplus on September 30 after payment of dividends amounted to $13,277,379 against $11,673,800 on June 30, last.

Simms Petroleum

Simms Petroleum Co. and subsidiaries report for the three months ended September 30 net loss of $657,854 after interest, taxes, drilling costs, depreciation, depletion, and after deducting $88,919 loss on sale of property, compared with net loss of $1,303,277 in the previous quarter, and net loss of $154,760 in the September quarter last year. For the first nine months of 1931 the company re-

(Continued on Page 102)

STANDARD OIL STOCKS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.
(Complete record week ending Nov. 14)

1931 High	1931 Low	Week ended Nov.14 Sales	Week ended Nov.14 High	Week ended Nov.14 Low	Close Nov.18	Stocks	Outstanding capital	Par value	Div. rate	Payable or last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1	⅛	No sales	..	..	..	Atlantic Lobos	499,448	N.P.	....	5-28-30	..	..	..	..	1	⅛
16	6¼	50	12	12	..	Borne Scrymser	$1,000,000	$25	....	10-15-30	56½	44½	46½	25	25	11¼
56	39	100	45	45	..	Buckeye Pipe Line	$10,000,000	$50	$1Q	12-15-31	76	53	74½	55	69	39⅞
129½	88	No sales	..	..	..	Chesebrough Mfg.	$3,000,000	$25	$1Q‡	9-30-31	161	117	210	130	184⅞	104¼
3⅞	1⅝	3,100	2⅝	2¼	2¼	Creole Petroleum (sh)	5,977,872	N.P.	....	.....	17½	9½	11¾	5⅝	7⅞	3
39	20⅝	50	28	28	..	Cumberland Pipe Line	$1,500,000	$50	50cQ	6-15-31	114	67	75¾	40	65¾	20¼
36	19	50	28	28	..	Eureka Pipe Line	$5,000,000	$100	$1Q	11- 1-31	88	64¼	70½	40	54¾	26
3	1	200	1⅛	1⅛	..	Galena Oil Corp.	$16,000,000	$100	....	.....	13	4¼	6½	3	7	2½
72	47¾	600	61	54	53	Humble Oil & Refining	$74,103,300	$25	50cQ	10- 1-31	114¾	59½	128	74⅛	119	57¼
18¼	7⅝	4,200	12	10⅞	10⅝	Imperial Oil of Canada (new) (sh)	25,421,768	N.P.	12½cQ	12- 1-31	104	56¾	41	22	30	15
21⅛	5½	700	10	8¼	..	Indiana Pipe Line (new)	$3,000,000	$10	25cQ	8-15-31	91⅞	74⅝	41⅞	26	41	14½
15½	7⅝	10,800	12¼	10⅞	11⅛	International Petroleum (new) (sh)	14,247,088	N.P.	25cQ	9-15-31	55	35	30⅜	15	24	11⅝
17½	8⅛	700	10½	9¾	..	National Transit	$6,362,500	$12.50	25cQ	9-15-31	32⅝	19⅜	25⅛	10¼	22⅜	11½
14½	5⅞	300	8⅝	8⅝	..	New York Transit	$1,000,000	$10	25cQ	10-15-31	75	38½	17½	10	21⅜	10⅛
35½	20	100	35	34	..	Northern Pipe Line	$2,000,000	$50	$2SA	7- 1-31	69	56½	63	41	54	26¼
15½	6	No sales	..	..	..	Penn Mex Fuel	$10,000,000	$25	50c	10-31-31	84	28	44½	20	32	12
16½	3¼	No sales	..	..	..	Solar Refining	$4,000,000	$25	....	12-20-29	..	..	50	20	33	4⅞
23⅞	12	1,400	15½	14	13½	South Penn Oil	$30,000,000	$25	25cQ	9-30-31	71⅞	36¾	60¼	35½	45⅞	16⅛
17	9	300	14½	13	..	Southern Pipe Line	$1,000,000	$10	50cQ	9- 1-31	19	15	22½	13	20⅞	8⅝
42½	28	200	40	39	..	Southwest Pennsylvania Pipe Line	$1,750,000	$50	$1Q	10- 1-31	102	70	70	60	64	32
38⅛	15⅞	28,900	23¾	20⅞	21⅛	Standard Oil of Indiana	$348,175,069	$25	25cQ	9-15-31	95⅞	70⅞	63	45	59⅞	30
23⅝	13¼	3,600	18	16½	16¾	Standard Oil of Kentucky	$25,654,516	$10	40cQ	9-30-31	179¾	122¼	46⅞	29	40½	18⅝
36½	16½	200	25	25	..	Standard Oil of Nebraska	$4,649,225	$25	50cQ	12-21-31	54⅞	39⅞	50¼	40	48⅞	34⅝
62½	35	800	45½	43	..	Standard Oil of Ohio	$14,000,000	$25	62½cQ	10- 1-31	134	71	129	60	108½	43¼
4½	2⅝	No sales	..	..	..	Swan-Finch Co.	$861,466	$25	....	1-15-29	23¼	16	18	10	10	4

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus 50 cents extra.

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending Nov. 14)

1931 High	1931 Low	Week ended Nov. 14 Sales	Week ended Nov. 14 High	Week ended Nov. 14 Low	Close Nov. 18	Stocks—		Outstanding capital	Par value	Div. rate	Payable or last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
1¾	¼	600	½	⅜	..	American Maracaibo	(sh)	700,000	N.P.	....	.....	9½	3⅛	8⅝	1⅛	4½	⅛
16⅞	6¼	No sales	..	..	..	British American Oil Corp.		1,311,321	N.P.	20cQ	10- 1-31	55	32¾	62	7⅞	23	13⅜
2⅜	½	No sales	..	..	½	Carib Syndicate		$131,250	25c	....	.....	4½	3⅞	4⅞	1	2¾	⅝
20¾	5¼	63,800	8⅜	7⅝	7⅝	Cities Service	(sh)	24,290,359	N.P.	30cA§	11- 1-31	90⅞	54	68⅛	20	44¼	13
84¾	35⅝	1,600	58¾	55½	..	Cities Service pfd.	(sh)	1,500,000	N.P.	50cM	11- 1-31	103¼	94½	98¾	84	93⅞	78¼
½	⅜	300	⅛	⅛	⅛	Colombia Syndicate		$2,000,000	$1	....	.....	3¼	.76	2	½	¾	⅛
2¾	1¼	8,500	1½	1⅜	1¼	Consolidated Royal		$5,527,875	$10	5cQ	10-25-31	8⅞	6¼	11⅛	2½	5⅞	2
⅝	⅛	No sales	..	..	..	Crown Central		.....	....	....	.....	..	..	..	..	..	..
5	2	1,100	2¾	2⅝	..	Darby Petroleum (new)		1,019,392	N.P.	....	10-15-30	33½	3¼	26	6½	21¾	4¼
6	1¾	No sales	..	..	..	Derby Oil & Refining	(sh)	500,000	N.P.	....	.....	2¼	1	11	2	11	2
40⅛	25	No sales	..	..	..	Derby Oil & Refining pfd.		48,500	N.P.	....	.....	21⅛	7½	44	20¾	60	30
75½	38	4,600	56½	48	47½	Gulf Oil Corp.	(sh)	4,504,921	$25	37½cQ	10- 1-31	165	101⅛	209	115	166⅞	58½
⅝	⅛	9,400	⅜	¼	⅛	Intercontinental Petroleum		$5,682,000	$5	....	.....	3⅜	1	2⅞	⅝	1¾	⅜
1⅞	½	No sales	..	..	..	Kirby Petroleum	(sh)	750,000	N.P.	....	.....	3	1¼	3⅝	1¼	3	⅞
1½	⅛	1,700	½	⅜	..	Leonard Oil & Development		$50,000,000	$25	....	.....	9⅜	5⅛	6½	1	4⅜	½
6¾	2¾	No sales	..	..	..	Lion Oil & Refining	(sh)	250,000	N.P.	....	10-27-30	43⅞	20	38⅞	18	29	4⅞
25	7⅛	6,600	10¾	10	9⅝	Lone Star Gas	(sh)	5,000,000	N.P.	22cQ	9-30-31	69⅛	48½	67⅞	28	55⅞	19⅝
½	⅛	3,300	⅛	⅛	..	Magdalena Syndicate	(sh)	850,000	$1	....	.....	1⅞	½	1¼	½	½	⅛
5	2⅝	100	4½	4½	..	Margay Oil Corp.		160,000	N.P.	....	7-10-30	48½	32	38½	14	16	3
4⅞	1½	No sales	..	..	..	Mexico-Ohio Oil Co.		500,000	N.P.	....	.....	8	2¾	6⅜	2¼	7½	1¾
½	⅛	No sales	..	..	..	Mountain & Gulf		$4,000,000	$1	....	4-15-31	1¾	.76	1½	½	¾	⅜
5⅞	2½	1,000	3⅞	3½	..	Mountain Producers		$1,682,182	$10	25cQ	10- 1-31	28⅞	19½	22⅞	7	12⅛	3¾
1½	½	No sales	..	..	..	New Bradford Oil		$1,095,291	$5	....	4-15-31	5⅝	4¼	5	2½	3½	1⅛
3	¾	100	1⅛	1⅛	..	New Mexico and Arizona		$1,000,000	$1	....	.....	11⅞	7½	9⅜	2¼	7¼	1½
3¼	1	No sales	..	..	..	North Central Texas	(sh)	400,000	N.P.	....	9- 2-30	14¼	8½	18½	6⅛	11¼	2½
½	⅛	1,000	⅛	⅛	⅛	Pandem	(sh)	489,875	N.P.	....	.....	6	2⅛	3½	½	2½	¼
2	⅜	1,300	⅞	⅝	⅝	Pantapec Oil	(sh)	1,506,000	N.P.	....	.....	15⅝	8½	10½	1⅞	4⅜	⅞
3⅛	½	2,400	1⅝	⅞	..	Reiter-Foster	(sh)	388,584	N.P.	....	12- 2-29	12⅞	4⅛	8½	1⅛	5⅜	1
3	1	100	1⅞	1⅞	..	Ryan Consolidated	(sh)	500,000	N.P.	....	.....	12	4⅛	11	2	8⅝	2
1⅜	¼	100	½	½	..	Salt Creek Consolidated	(sh)	1,286,300	$10	....	4- 1-31	7¼	5½	5⅞	1⅞	2½	½
7¾	3¾	1,300	4⅞	4¾	4¾	Salt Creek Producers	(sh)	1,496,859	$10	25c	11- 2-31	35	23⅛	25⅞	9	15¼	5¼
5¼	⅞	4,100	⅞	⅞	..	Sunray Oil	(sh)	1,163,185	$5	....	4-15-31	..	..	12	5⅝	10	2
1⅞	⅝	1,150	⅝	½	..	Venezuelan Petroleum	(sh)	755,090	$5	....	2-15-30	9⅛	4¾	6½	1¾	4½	⅝
3½	1⅛	No sales	..	..	..	Woodley Petroleum		$500,000	$1	....	3-31-29	8¼	4⅞	9½	2	5	½
2¼	¼	8,400	¾	½	½	Y Oil & Gas		100,000	N.P.	....	.....	8⅜	2⅛	2⅞	½	2½	⅝

*Ex-dividend. †Unit of trading less than 100 shares. ‡Payable monthly and monthly stock dividend of one-half per cent. §Paid in lieu of regular cash dividend of 2 per cent.

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of the New York Stock Exchange and Associate Members of New York Curb, Kennedy Building, Tulsa, Okla.

(Complete record week ending Nov. 14)

1931 High	1931 Low	Week ended Nov. 14 Sales	Week ended Nov. 14 High	Week ended Nov. 14 Low	Close Nov. 18	Stocks—		Outstanding capital	Par value	Div. rate	Payable or last paid	1928 High	1928 Low	1929 High	1929 Low	1930 High	1930 Low
23	13	1,000	18	16½	16¾	Amerada Corp.	(sh)	922,075	N.P.	50cQ	10-30-31	43⅞	27⅛	42⅝	17½	31½	16½
12⅜	2¼	300	3	2⅞	..	American Republics Corp.	(sh)	209,180	N.P.	....	12-31-30	85	51⅛	64¾	12½	37	5⅛
31	9¼	No sales	..	..	..	Associated Oil		$57,260,300	$25	....	6-30-31	53⅜	37½	47¼	34½	51	30
23⅝	9½	13,100	15⅞	13¼	13	Atlantic Refining		$66,763,775	$25	25cQ	9-15-31	66⅜	50	77⅞	30	51⅜	16⅝
14½	4¾	29,700	8½	7	7⅛	Barnsdall Corp. A		$56,546,600	$25	....	5-11-31	54	20	49⅛	20	34	8⅝
12	5	25,800	9¼	7½	7½	Continental Oil of Delaware	(sh)	4,741,554	N.P.	....	12-15-27	..	..	47⅞	18	30½	7¾
47	9⅝	8,700	18⅜	15¼	15⅜	General Asphalt	(sh)	413,333	N.P.	50cQ	9-15-31	94⅞	68	94¾	42¼	71½	22⅜
68½	19	13,300	32½	26¼	26¼	Houston Oil		$24,968,600	$100	....	10-17-30	167	79	109	26	116⅞	29¼
4⅝	1⅝	800	2½	2⅜	2	Indian Refining		$12,564,070	$10	....	10- 1-30	39⅝	9	53	13⅛	17	2
4½	1⅜	3,300	1¾	1½	..	Louisiana Oil Refining	(sh)	1,190,063	N.P.	....	.....	19¾	9¾	18	7	12	3½
3¾	½	600	1⅛	1	..	Maracaibo Oil	(sh)	330,000	N.P.	....	.....	25½	12½	18½	5⅛	10⅜	1⅜
16¾	5	9,500	9¼	7½	7½	Mid-Continent Petroleum	(sh)	1,857,912	N.P.	....	2-16-31	44½	25⅛	39⅞	22⅛	32	11
19½	6½	19,400	10¼	8¼	8⅜	Ohio Oil	(sh)	6,648,052	N.P.	....	3-14-31	84	58½	79⅞	64¼	32	16
35⅛	20	No sales	..	..	..	Pan American P. & T.		$50,084,700	$50	40c	10-20-31	50⅞	38¼	69	40½	46½	42
36½	20	100	24⅛	24⅛	..	Pan American P. & T. "B"		$121,110,650	$50	40c	10-20-31	59⅞	37⅜	69¼	40½	67¼	30
4¼	¾	100	1⅜	1⅜	..	Panhandle P. & R.	(sh)	199,370	N.P.	....	.....	21¾	11½	15¼	3	12⅜	1⅜
20⅛	9½	20	9½	9½	..	Panhandle P. & R. pfd.		$2,564,400	$100	....	.....	108	70	76	47½	20	47½
16⅝	4¾	22,800	9	7¼	7⅛	Phillips Petroleum	(sh)	2,593,075	N.P.	....	1- 2-31	53⅞	35¼	47	24¼	44⅜	11½
1½	⅝	700	⅝	½	½	Pierce Oil Corp.		$29,622,831	$25	....	.....	5¼	½	3⅜	1	2½	½
3⅜	⅞	1,200	1¾	1⅜	1¼	Pierce Petroleum	(sh)	2,500,000	N.P.	....	2-16-31	7	3½	5⅞	½	7⅛	1⅛
20⅜	5½	3,100	10¼	7⅝	7⅜	Prairie Oil & Gas		$60,848,000	$25	....	3-31-31	68	46	65⅝	40½	54	11¼
26½	7⅝	4,800	12	9⅞	10	Prairie Pipe Line		$101,250,000	$25	....	6-30-31	280	172	65	45	60	16⅝
6	1½	600	2	1¾	1½	Producers & Refiners		$37,438,950	$50	....	9-15-23	29⅞	16	25⅞	4	11⅞	1
16	4¼	No sales	..	..	..	Producers & Refiners pfd.		$2,845,350	$50	....	5- 4-25	49⅝	41	46⅜	25½	40	11½
11⅞	5	5,600	7½	6½	6⅛	Pure Oil		$75,959,250	$25	....	9- 1-30	31⅝	19	30¾	20	27¼	7⅝
6⅜	⅞	2,600	1⅛	⅞	1	Richfield Oil (new)		$52,410,875	N.P.	....	.....	56	23	49⅝	20	9¾	4⅛
10¼	2⅛	4,300	3⅜	2¾	2¾	Rio Grande Oil	(sh)	1,236,270	N.P.	....	7-25-30	37½	32	42½	15	25⅜	5
42⅝	13½	8,900	19⅛	17⅜	17	Royal Dutch N. Y.	(sh)	611,303	....	$0.938	8- 4-31	64	44⅝	64	43½	56½	36⅞
20⅜	5½	22,900	10¼	8¼	8½	Seaboard Oil of Delaware	(sh)	1,244,383	N.P.	....	10- 1-24	72	4⅝	59⅜	8¼	37	9¾
34	9¾	150	14	13¾	..	Shell Transport & Trading Co.		£23,985,000	£1	$0.966	7- 6-31	47⅞	41⅜	51½	40⅝	48⅜	26
10¼	3¼	14,200	5½	4⅜	4⅜	Shell Union Oil	(sh)	13,066,497	N.P.	....	6-30-30	39¼	23¼	31⅜	19	25½	5¼
11	4¾	4,000	7	4¾	6	Simms Petroleum		$8,353,620	$20	....	9-15-30	27½	18⅛	40⅛	15	37	5⅝
15⅞	5½	82,600	9¼	7⅜	7⅛	Sinclair Consolidated	(sh)	5,500,000	N.P.	....	4-15-31	46¾	17⅜	45	21	32	9⅝
103	77	300	88	87	82	Sinclair Consolidated pfd.		$16,025,250	$100	$2Q	11-14-31	110	102½	111	103	112¼	86
12⅞	3⅛	2,600	5⅞	4⅛	4⅛	Skelly Oil		$27,441,250	$25	....	12-15-30	42⅝	25	40½	28	12	10⅛
21	12⅛	30,900	15⅝	14	13¾	Socony-Vacuum	(sh)	31,923,072	$25	40cQ	9-15-31	..	..	..	..	..	..
51¾	28⅛	44,900	36¾	33⅛	32¾	Standard of California	(sh)	12,594,098	N.P.	62½cQ	12-15-31	80	63	81⅞	51½	75	42½
19	8¼	2,700	13½	12¼	12¼	Standard of Kansas		$8,000,000	$25	....	3-16-31	37¾	15	33¾	18	49	14⅜
52½	28¼	94,800	37⅞	34	33⅝	Standard Oil of New Jersey		$634,999,200	$25	25cQ§	9-15-31	59⅜	37¾	83	49	84⅞	32½
45¼	26¾	300	34½	34	31⅞	Sun Oil	(sh)	1,416,869	N.P.	25cQ	9-15-31	77	31½	68⅜	55	70	39
1¾	½	700	¾	⅝	⅝	Superior Oil Corp.	(sh)	766,979	N.P.	....	12-20-30	..	..	24	5¼	9⅜	¾
36¼	15	36,800	21½	18⅛	18¾	The Texas Corporation		$246,204,900	$25	50cQ	10- 1-31	74¾	50	71⅞	50	60½	28¼
6½	2½	3,200	3⅝	3	..	Texas Pacific Coal & Oil Co.		$9,304,890	$10	....	12-31-29	26⅝	12⅛	23⅞	9½	14½	4
18	9⅞	No sales	..	..	..	Tide Water Oil	(sh)	2,191,759	N.P.	....	6-30-31	41½	19⅝	40	14	31	13
83	35	No sales	..	..	45	Tide Water Oil pfd.	(sh)	19,947,000	N.P.	$1.25Q	11-16-31	100⅛	86	97½	85⅛	94⅞	71
9	3½	14,700	5¼	4¼	4	Tide Water Associated	(sh)	5,560,424	N.P.	....	2-16-31	25	14¾	23½	10	17¾	5⅛
68	20½	4,200	37	33	33	Tide Water Associated pfd.		$73,284,500	....	$1.50Q	10- 1-31	..	..	90⅞	74⅛	89¾	55
26⅝	11¾	9,900	18	16¼	16¼	Union Oil of California		$104,342,375	$25	50cQ	11-10-31	58	42⅜	57	42½	50	10⅛
25⅛	18½	No sales	..	..	19	Union Tank Car	(sh)	1,254,048	$100	40cQ	12- 1-31	128½	110	163¾	121⅞	38½	23
7¾	1	600	2⅞	2½	..	Warner-Quinlan	(sh)	632,948	N.P.	....	7- 1-30	44⅞	26	42⅞	15	27	4¼
9⅜	3	1,700	5¼	4¾	5⅛	Wilcox Oil & Gas	(sh)	428,907	N.P.	....	5-10-28	..	..	29¾	12⅞	21	6½

*Ex-dividend. †Unit of trading less than 100 shares. ‡Plus extra dividend of 25 cents.

In comparing highs and lows for the several years in the three tables, it will be necessary to take into consideration cases where there have been stock split-ups.

OCTANE NUMBER OF GASOLINE HIGHER

(Continued from Page 16)

somewhat lower level during the winter months.

3. A large majority of the samples in all of the surveys had less than 0.10 per cent of sulphur; 50 per cent or more of all samples in each survey were found to have 0.06 per cent of sulphur or less.

4. Low-sulphur fuels are sold in all cities included in the four surveys. The motor fuels sold in the Rocky Mountain cities, Denver, Laramie and Salt Lake City, have the lowest sulphur content. Out of a total of 62 samples collected in these cities in these four surveys, only one sample containing more than 0.10 per cent of sulphur has been obtained. Sample 245, of this survey, a competitive-price gasoline from Salt Lake City, was found to contain 0.11 per cent of sulphur. El Paso has the smallest proportion of low-sulphur gasolines of any city included in these surveys.

The results of the examination for sulphur content of the 207 samples of competitive-price gasoline and 105 premium-price motor fuels included in the present survey may be summarized as follows:

85.8 per cent of all samples, 83.9 per cent of the samples of competitive-price gasoline, and 89.3 per cent of the premium-price motor fuels had 0.10 per cent of sulphur or less and therefore came within the limit of the federal specification for sulphur content of motor fuel.

66.6 per cent of all samples, 67.5 per cent of the competitive-price gasoline samples, and 64.6 per cent of the premium-price motor fuels had 0.08 per cent of sulphur or less, and therefore may be considered not to constitute a problem in reduction of sulphur content (see R.I. 3,026).

53.1 per cent of all samples, 54.0 per cent of the competitive-price gasolines, and 51.3 per cent of the premium-price motor fuels had 0.06 per cent of sulphur or less, which indicates that the commercial standard for sulphur content of motor fuels is well within the limit of the federal specifications.

"Gum" Content by the Bureau of Mines Steam-Oven Test

Results of the steam-oven test are generally considered to give a true indication of the amount of gum in the gasoline at the time the test is made. This "gum" is therefore sometimes spoken of as "preformed" gum to distinguish it from the gum content as indicated by the copper-dish test, which is considered to be a measure of the "potential gum" in the gasoline.

The steam-oven gum content of 288 of the 312 samples in this survey, or 92.3 per cent, was reported as "nil," that is, less than 5 milligrams per 100 milliliters. Of the 24 samples which were found to contain an appreciable proportion of steam-oven gum, 12 samples or 3.8 per cent of all samples had 5 milligrams of gum; 8 samples, or 2.6 per cent, had 10 milligrams, 2 samples had 15 milligrams, 1 had 20 milligrams and 1 sample, No. 309, a premium-price motor fuel from San Francisco, had 100 milligrams of steam-oven gum per 100 milliliters of sample. This sample also showed 300 milligrams of copper-dish gum. This large proportion of "preformed" and "potential" gum leads the authors to suggest the possibility of a contaminated sample.

Antiknock Values

The Bureau of Mines is indebted to the Bureau of Standards for the following section dealing with the octane number ratings of the individual samples of this survey. The tables that were prepared by White and Cummings have been numbered successively with the tables dealing with the foregoing discussion so that the entire paper forms a unit. Sample numbers in the following section are the same as have been used throughout the survey.

The recommendation by the Society of Automotive Engineers and by a subcommittee of the Institution of Petroleum Technologists that knock testing results be expressed in octane numbers is being followed by an increasing number of laboratories. Several cities have included an octane number requirement in their motor fuel purchase specifications but no such requirement is contemplated at present in the federal specification for U. S. Government motor gasoline. The North Dakota colored gasoline law has been amended to permit the use of any harmless dye in gasoline having a knock rating of at least 60 octane number.

The octane numbers of standard mixtures of normal heptane and iso-octane (2, 2, 4 trimethyl pentane) are numerically the percentages (by volume) of iso-octane which they contain. The octane number of a fuel is the octane number of the standard mixture which it matches in knock value when tested by an approved method. The apparatus and method employed by the Bureau of Standards are those tentatively adopted by the subcommittee on methods of measuring detonation.

TABLE 3—DETONATION SURVEY OF COMMERCIAL MOTOR FUELS
Comparison of Average Samples by Cities

City—	Approx. octane No. Competitive price gasoline 23rd sur.	Competitive price gasoline 22nd sur.	Premium price motor fuels 23rd sur.	Premium price motor fuels 22nd sur.
Boston	64	64	80	76
New York	64	61	76	72
Washington	68	66	80	75
Pittsburgh	68	68	79	78
Atlanta	65	63	77	73
Cleveland	65	65	78	76
Chicago	63	65	69	72
New Orleans	66	62	74	74
St. Louis	56	55	74	71
Minneapolis-St. Paul	59	51	73	71
Omaha	54	55	73	68
Tulsa	60	58	76	74
Dallas	63	55	74	..
Denver	59	55	..	65
El Paso	60	56	74	74
Salt Lake City	64	60	78	74
Seattle	66	64	86	80
Los Angeles	62	58	81	..
San Francisco	62	64	83	80

Each sample was compared in a single cylinder test engine equipped with bouncing pin and gas evolution burette detonation indicator with blends of a West Virginia straightrun gasoline and a commercial benzine. This secondary scale was calibrated against the heptane-octane primary scale just before making the tests.

The average ratings of the competitive price gasolines and the premium price motor fuels from each city in the present survey, together with the values obtained on composite samples in the previous survey, are given in Table 3. The average rating for the 207 competitive price samples is 62.5 octane number and the average for the 105 premium price samples is 77.0 octane number, a gain of 3.3 units over the average results of the previous survey. The average rating of competitive price gasoline has increased 10 units in Cleveland and eight units in Chicago, Minneapolis-St. Paul and Dallas. It decreased one unit in Omaha and two units in San Francisco. The average rating of premium price motor fuel has increased five units in Washington and Omaha and six units in Seattle. It decreased three units in Chicago, reducing the spread in that city between competitive and premium fuels from 17 units to only 6 units. There is an average spread of 20 units between competitive and premium fuels in the three Pacific Coast cities.

Table 4 shows that 32.4 per cent of the samples of competitive price gasoline are in the range 60 to 64 octane number while 72.5 per cent are in the range 55 to 69 octane number. Table 5 shows that 43.8 per cent of the premium price motor fuels sampled are rated 75 to 79 octane number and 76.2 per cent are in the range 70 to 84 octane number. Sample 152 from St. Louis (octane number, 50) is the one premium price fuel most strikingly out of line.

TABLE 4—CLASSIFICATION OF SAMPLES ACCORDING TO KNOCK RATING
Competive Price Gasoline

City—	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	Ttl.
	Octane numbers								
Boston	0	0	0	2	3	5	0	0	10
New York	0	0	0	2	3	2	3	0	10
Washington	0	0	0	0	1	5	4	0	10
Pittsburgh	0	0	0	1	1	3	5	0	10
Atlanta	0	0	0	4	2	1	6	0	13
Cleveland	0	0	2	1	2	3	2	2	12
Chicago	0	0	2	1	6	4	1	0	14
New Orleans	0	1	0	0	3	4	2	1	11
St. Louis	1	2	4	2	3	1	1	0	14
Minneapolis-St. Paul	1	0	2	2	3	3	0	0	11
Omaha	0	1	5	3	2	0	0	0	11
Tulsa	0	0	1	5	4	0	0	0	10
Dallas	0	0	0	4	1	2	2	0	9
Denver	0	0	1	4	2	0	1	0	8
El Paso	0	0	1	0	5	0	0	0	6
Salt Lake City	0	0	0	0	8	2	0	0	10
Seattle	0	0	0	0	3	4	2	0	9
Los Angeles	0	0	0	4	7	4	1	0	16
San Francisco	0	0	0	1	8	4	0	0	13
Total	2	4	18	36	67	47	30	3	207
Per cent of total	1.0	1.9	8.7	17.4	32.4	22.7	14.5	1.4	100

TABLE 5—CLASSIFICATION OF SAMPLES ACCORDING TO KNOCK RATING
Premium Price Motor Fuels

City—	50 to 54	55 to 59	60 to 64	65 to 69	70 to 74	75 to 79	80 to 84	85 to 89	Ttl.
	Octane numbers								
Boston	0	0	0	0	1	1	3	1	6
New York	0	0	0	1	1	4	0	0	6
Washington	0	0	0	0	2	3	3	2	10
Pittsburgh	0	0	0	0	1	2	3	0	6
Atlanta	0	0	0	0	1	1	0	1	3
Cleveland	0	0	0	0	0	4	0	0	4
Chicago	0	0	2	1	2	1	0	0	6
New Orleans	0	0	0	1	2	2	0	0	5
St. Louis	1	0	0	0	0	4	1	0	6
Minneapolis-St. Paul	0	0	0	2	0	3	0	0	5
Omaha	0	0	1	0	1	3	0	0	5
Tulsa	0	0	0	0	2	4	0	0	6
Dallas	0	0	0	1	2	4	0	0	7
Denver	No premium price fuels sampled in Denver								
El Paso	0	0	0	1	2	3	0	0	6
Salt Lake City	0	0	0	0	0	1	1	0	2
Seattle	0	0	0	0	0	1	1	5	7
Los Angeles	0	0	0	0	0	4	3	2	8
San Francisco	0	0	0	0	0	1	3	3	7
Total	1	0	3	7	17	46	17	14	105
Per cent of total	1.0	0	2.8	6.7	16.2	43.8	16.2	13.3	100

EAST TEXAS FIELDS

(Continued from Page 25)

on the east edge have already been put on pump, and not shot.

Stanolind Oil & Gas Co. and Simms Oil Co.'s No. 1 Miller in the S. L. Davis Survey, western Gregg County, was plugged back to minus 3,327 feet after testing salt water at minus 3,335 feet, and is now flowing pipe line oil.

Eastland Oil Co.'s No. 1 Victory in the Evans Survey, north of Gladewater and on the extreme western edge of the Upshur County producing area, was abandoned this week at a total depth of 3,659 feet. Sand was topped at 3,640 feet. Salt water prompted the plugging of this well which stands as another western edge marker for the field.

Western Marker

E. L. Chapman and others' No. 1-A Williamson in the W. R. Cooke Survey, west of production between Kilgore and Overton, was completed at a total depth of 3,692 feet. This makes bottom of the hole minus 3,321 feet, or below the salt water level in this area. Sand was topped at 3,691 feet. The well produced 45 bbls. of pipe line oil in one hour through three-quarters inch choke on tubing, against 100 pounds pressure. This well is on the extreme western side of the field, and will no doubt prove a marker in this area, as one other well in the vicinity has already been plugged because of salt water troubles.

Henderson County Deal

The Westyde Development Co. assigned 1,000 acres of its block southwest of Athens in Henderson County to Church Ryder, and the South American Drilling Co. is now rigging up rotary 330 feet from north and west lines of the southeast 40 acres of a 485-acre tract in the Thomas Parmer Survey, approximately 1½ miles southwest of the town. The Tidal Oil Co., Humble Oil & Refining Co. and others have purchased acreage around this test. Fee name of the lease is Broome. This is another interesting wildcat for this county which had a big play in 1930 when several tests were drilled in various parts of the county. Shell Petroleum Corp.'s No. 1 Larue in the eastern part of the county being the most interesting and closely watched, and around which a big royalty and lease play took place, leases and royalties bounding sky high during the height of the play. Proving a dry hole punctured hopes for production in the area, and checked activities in the county at that time.

Angelina County

Mrs. B. P. Herber has assembled a block of some 7,000 acres near Zavala in Angelina County, most of it owned by the Long Bell Lumber Co. The acreage was taken for the Hightower Petroleum Co. of Oklahoma City, which will drill a well in the southeast corner of H.T.&B. Survey, in Section 9, the test to go to 3,000 feet, and to be spudded by December 5. The land includes all of the Thomas Smith Survey except two or three small tracts; Sections 9, 10 and 11, H.T. &B. Survey, Sections 13 and 15, E.T. Railroad Survey, all of the L. E. Russell Survey and some other small surrounding tracts.

Gregg County

Abernathy & Kilpatrick's No. 1 J. H. Victory, top sand 3,669 feet, initial production 125 bbls. per hour through various chokes, total depth 3,688 feet. Amerada Petroleum Corp.'s No. 3 Hearne, top sand 3,514 feet, initial production 48 bbls. per hour through fifty-nine-sixty-fourths-inch tubing choke, total depth 3,515 feet. Same corporation's No. 2 A. Tooke, top sand 3,488 feet, initial production 125 bbls. per hour through 1-inch tubing choke, total depth 3,516 feet. Same corporation's No. 2 Tuttle, top sand 3,522 feet, initial production 107 bbls. per hour through 1-inch tubing choke, total depth 3,550 feet. Arkansas Fuel Oil Co.'s No. 3 Clemmons, top sand 3,615 feet, initial production 85 bbls. in 30 minutes through open tubing, total depth 3,637 feet. Same company's No. 2 Tuttle, top sand 3,575 feet, initial production 90 bbls. in 30 minutes through open tubing, total depth 3,596 feet. Atlantic & Pacific's No. 1 O. R. Johnson, top sand 3,600 feet, initial production 110 bbls. per hour through various chokes, total depth 3,631 feet. Atlantic Oil & Production Co.'s No. 3 Bunside, top sand 3,494 feet, initial production 175 bbls. per hour through open tubing, total depth 3,532 feet.

Barkley & Meadows' No. 2 Flemster, top sand 3,580 feet, initial production 200 bbls. per hour through open tubing, total depth 3,620 feet. Cal-Pet Corp.'s No. 3 Jones, top sand 3,619 feet, initial production 133 bbls. per hour through three-quarters-inch tubing choke, total depth 3,640 feet. T. J. Cannon's No. 1 Forshee Estate, top sand 3,610 feet, initial production 90 bbls. per hour through three-quarters-inch tubing choke, total depth 3,622 feet. Christian & Edward's No. 1 Bumpass, top sand 3,550 feet, initial production 120 bbls. per hour through open tubing, total depth 3,590 feet.

Danciger Oil & Refining Co.'s No. 2 Willie Christian, top sand 3,587 feet, initial production 125 bbls. per hour through various chokes, total depth 3,613

feet. J. E. Harper's No. 1 J. H. Sheppard, top sand 3,543 feet, initial production 125 bbls. per hour through various chokes, total depth 3,575 feet. Houston Oil Co.'s No. 3 Bauknight, top sand 3,578 feet, initial production 125 bbls. per hour through various chokes, total depth 3,618 feet. Howard Petroleum Corp.'s No. 1-A Arch Davis, top sand 3,523 feet, initial production 125 bbls. per hour through various chokes, total depth 3,610 feet.

Humble Oil & Refining Co.'s No. 3 Bole, top sand 3,602 feet, initial production 90 bbls. per hour through three-quarters-inch tubing choke, total depth 3,658 feet. Same company's No. 3 L. Christian, top sand 3,621 feet, initial production 56 bbls. per hour through three-quarters-inch tubing choke, total depth 3,672 feet. Same company's No. 3 Wells, top sand 3,680 feet, initial production estimated 120 bbls. per hour through three-quarters-inch tubing choke, total depth 3,701 feet. W. R. Jones' No. 2 B. C. Satterwhite, top sand 3,662 feet, initial production 125 bbls. per hour through various chokes, total depth 3,682 feet.

Magnolia Petroleum Co.'s No. 4 Davis, top sand 3,499 feet, initial production 242 bbls. per hour through 1-inch tubing choke, total depth 3,516 feet. Same company's No. 2 Tuttle, top sand 3,595 feet, initial production 165 bbls. per hour through 1-inch tubing choke, total depth 3,618 feet. George Miller and others' No. 1 Lloyd Jones, top sand 3,541 feet, initial production 100 bbls. per hour through open tubing, total depth 3,600 feet. Mook-Tex Oil Co.'s No. 3 D. Rodden, top sand 3,658 feet, initial production 165 bbls. per hour through open tubing, total depth 3,688 feet.

O. G. Murphy's No. 1 Doby, top sand 3,520 feet, initial production 125 bbls. per hour through various chokes, total depth 3,560 feet. O. G. Murphy's No. 1 H. E. Geisler, top sand 3,498 feet, initial production 250 bbls. in 2½ hours through three-fourths inch tubing choke, total depth 3,518 feet. National Oil & Gas Co.'s No. 2 Blackstone, top sand 3,542 feet, initial production estimated 125 bbls. per hour through various chokes, total depth 3,600 feet. Navarro Oil Co.'s No. 2 Harris, top sand 3,509 feet, initial production 25 bbls. per hour through 1¼-inch tubing choke, total depth 3,540 feet.

Pilot Oil Co.'s No. 2 Harris, top sand 3,525 feet, initial production estimated 125 bbls. per hour through various chokes, total depth 3,545 feet. Prairie Oil & Gas Co.'s No. 1 Aiken, top sand 3,534 feet, initial production 100 bbls. per hour through three-fourths inch tubing choke, total depth 3,546 feet. Same company's No. 1 Will York, top sand 3,569 feet, initial production 75 bbls. per hour through three-fourths inch tubing choke, total depth 3,576 feet.

Selby Oil & Gas Co.'s No. 4-A H. L. Snavely, top sand 3,565 feet, initial production 100 bbls. per hour through open tubing, total depth 3,592 feet. Shano Oil Co.'s No. 1 Hopkins, top sand 3,561 feet, initial production 180 bbls. per hour through three-fourths inch tubing choke, total depth 3,601 feet. Shell Petroleum Corp.'s No. 4 G. W. Ritchie, top sand 3,606 feet, initial production 125 bbls. per hour through various chokes, total depth 3,628 feet. Simms and Russ' No. 1 Flewellen, top sand 3,670 feet, initial production 180 bbls. per hour through open tubing, total depth 3,688 feet.

Sinclair Oil & Gas Co.'s No. 4 Lawson, top sand 3,475 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,514 feet. Same company's No. 16 Moncrief, top sand 3,548 feet, initial production, 125 bbls. in 30 minutes through open tubing, total depth 3,572 feet. Same company's No. 17 Moncrief, top sand 3,555 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,590 feet. Same company's No. 18 Moncrief, top sand 3,550 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,584 feet. Same company's No. 19 Moncrief, top sand 3,569 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,586 feet. H. B. & W. Oil Co.'s No. 2 J. C. Grey, top sand 3,601 feet, initial production 90 bbls. per hour through open tubing, total depth 3,634 feet. Stanolind and Simms Oil Co.'s No. 2 Albright, top sand 3,548 feet, initial production 116 bbls. in 30 minutes through open tubing, total depth 3,632 feet. Same company's No. 2-C Harley, top sand 3,596 feet, initial production 125 bbls. per hour through tubing, total depth 3,675 feet. Same company's No. 2 LaMaire, top sand 3,558 feet, initial production 180 bbls. per hour through open tubing, total depth 3,629 feet. Sun Oil Co.'s No. 6 Satterwhite, top sand 3,576 feet, initial production 146 bbls. per hour through open tubing, total depth 3,606 feet.

The Texas Company's No. 1 G. W. Lee, top sand 3,526 feet, initial production 105 bbls. per hour through three-fourths inch tubing choke, total depth 3,577 feet. Tidal Oil Co.'s No. 6 Nettleton, top sand 3,539 feet, initial production 100 bbls. in 10 minutes through open tubing, total depth 3,542 feet. Travis-Ware Oil Co.'s No. 1 Gladewater Colored School, top sand 3,616 feet, initial production 63 bbls. per hour through open tubing, total depth 3,625 feet. Tulsa Oil Co.'s No. 1 K. Mosely, top sand 3,480 feet, initial production 125 bbls. per hour through 1-inch tubing choke, total depth 3,506 feet. Vacuum Oil Co.'s No. 2 Goolsby, top sand 3,498 feet, initial production 233 bbls. per hour through open tubing, total depth 3,547 feet.

J. O. Whittington's No. 2 Bumpass, top sand 3,529 feet, initial production 40 bbls. in 15 minutes through 1-inch tubing choke, total depth 3,568 feet. Yount Lee Oil Co.'s No. 2 Bun Rodden, top sand 3,576 feet, initial production 78 bbls. per hour through eleven-sixteenths inch tubing choke, total depth 3,597 feet. Arkansas Fuel Oil Co.'s No. 2 Calvin Brown, top sand 3,566 feet, initial production 175 bbls. per hour through open tubing, total depth 3,590 feet. Combination Oil & Production Co.'s No. 1 William Holt, top sand 3,606 feet, initial production 110 bbls. per hour through three-fourths inch tubing choke, total depth 3,626 feet. Continental Oil Co.'s No. 4 Crews, top sand 3,666 feet, initial production 73 bbls. first 30 minutes through three-fourths inch tubing choke, total depth 3,674 feet.

Gulf Production Co.'s No. 5 Crim, top sand 3,572 feet, initial production 105 bbls. per hour through three-fourths inch tubing choke, total depth 3,585 feet. Same company's No. 6 Hilburn, top sand 3,620 feet, initial production 115 bbls. per hour through three-fourths inch tubing choke, total depth 3,627 feet. Houston and Heep Oil Corp.'s No. 2 Hall, top sand 3,653 feet, initial production 168 bbls. per hour through 1-inch tubing choke, total depth 3,665 feet. Iowa-Payne's No. 2 John Elder, top sand 3,553 feet, initial production 195 bbls. per hour through three-fourths inch tubing choke and 4-inch flow line, total depth 3,610 feet. W. H. Matthews and others' No. 1 Lula Martin, top sand 3,698 feet, initial production 70 bbls. in 30 minutes through 1-inch tubing choke, total depth 3,718 feet.

Magnolia Petroleum Co.'s No. 5 L. A. Griffin, top sand 3,575 feet, initial production 148 bbls. first 15 minutes through three-fourths inch tubing choke, total depth 3,589 feet. Same company's No. 3 J. King, top sand 3,664 feet, initial production 77 bbls. in 15 minutes through tubing, total depth 3,664 feet. Wallace and O'Neal's No. 1 E. L. Walker, top sand 3,538 feet, initial production 125 bbls. per hour through 1-inch tubing choke, total depth 3,553 feet.

Petroleum Finance Corp.'s No. 2 Laird-Crim, top sand 3,522 feet, initial production 45 bbls. in 15 minutes through 1-inch tubing choke, total depth 3,552 feet. Pilot Oil Co.'s No. 2 S. Johnson, top sand 3,536 feet, initial production 125 bbls. per hour through 1-inch tubing, total depth 3,554 feet. Prairie Oil & Gas Co.'s No. 1 Thomas, top sand 3,746 feet, initial production 50 bbls. per hour through three-fourths inch tubing choke, total depth 3,751 feet. Republic Production Co.'s No. 2 Watson, top sand 3,556 feet, initial production 102 bbls. in 30 minutes through 1½-inch tubing choke, total depth 3,603 feet.

Shell Petroleum Corp.'s No. 3 Bates, top sand 3,580 feet, initial production 95 bbls. in 30 minutes through open tubing, total depth 3,619 feet. Same corporation's No. 10 W. W. Elder, top sand 3,529 feet, initial production 32 bbls. per hour through 1-inch tubing choke, total depth 3,588 feet. Same corporation's No. 2 H. P. Neal, top sand 3,543 feet, initial production 72 bbls. in 30 minutes through open tubing, total depth 3,609 feet. Same corporation's No. 13 J. B. Watson, top sand 3,565 feet, initial production 80 bbls. in 30 minutes through open tubing, total depth 3,594 feet. Sinclair Oil & Gas Co.'s No. 7-B King, top sand 3,445 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,474 feet. Same company's No. 8-B King, top sand 3,432 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,469 feet. Same company's No. 4-B King, top sand 3,445 feet, initial production 125 bbls. in 30 minutes through open tubing, total depth 3,470 feet.

Stanolind & Simms Oil Co.'s No. 1 A. W. Miller, top sand 3,585 feet, initial production 20 bbls. per hour swabbing, total depth 3,601 feet. Tidal Oil Co.'s No. 5 King, top sand 3,547 feet, initial production 108 bbls. in 10 minutes through open tubing, total depth 3,592 feet. Vierson's No. 2 Muckelroy, top sand 3,541 feet, initial production 108 bbls. per hour through three-quarters-inch tubing choke, total depth 3,573 feet.

Rusk County

Burton Drilling Co.'s No. 3 Florey, top sand 3,684 feet, initial production 65 bbls. per hour through three-quarters-inch choke, total depth 3,686 feet. Byrd-Frost Oil Co.'s No. 2 Leverett, top sand 3,667 feet, initial production 125 bbls. per hour pinched through tubing, total depth 3,699 feet. Gulf Production Co.'s No. 3 C. E. Christian, top sand 3,705 feet, initial production 112 bbls. per hour through three-quarters-inch tubing choke, total depth 3,721 feet. Magnolia Petroleum Co.'s No. 7 Bradberry, top sand 3,658 feet, initial production 38 bbls. in 15 minutes through 4-inch line and three-quarters-inch tubing choke, total depth 3,666 feet.

Raitman's No. 1 W. P. Moore, top sand 3,726 feet, initial production 22½ bbls. in 15 minutes through three-quarters-inch tubing choke, total depth 3,732

DATA ON STORAGE IN THE EAST TEXAS AREA

Accompanying is a detailed report of the number and size of tanks in the East Texas district, in which Anderson, Cherokee, Gregg, Nacogdoches, Rusk, Shelby, Smith, Upshur and Van Zandt Counties are included; the present amount of oil in storage in the district, present room and capacity as of November 1.

EAST TEXAS STEEL STORAGE AS OF NOVEMBER 1, 1931

Company and location—	No. and size tanks	Capacity	Stock	Room
Arkansas P. L. Co., Longview	2-55,000	110,000	52,843	57,157
Atlantic P. L. Co., Kilgore	4-55,000			
	1-80,000	300,000	136,577	163,423
Cranfill-Reynolds, Longview	5-55,000			
	2-55,000	385,000	26,138	358,862
East Texas P. L. Co., Longview	2-10,000			
	1-80,000	100,000	471	99,529
Friar	1-80,000	80,000	3,292	76,708
		180,000	3,763	176,237
Empire G. & F. Co., Longview	2-80,000	160,000	46,543	113,457
Gulf P. L. Co., Henderson	2-10,000			
	1-55,000	75,000	35,586	39,414
Overton	1-55,000	55,000	10,155	44,845
Big Sandy	2-37,500			
	1-55,000	130,000	61,622	68,378
		260,000	107,363	152,637
Humble P. L. Co., Gladewater	1-35,000			
	1-55,000	90,000	36,154	53,846
Kilgore	1-30,000	30,000	9,535	20,465
Longview	1-30,000			
	8-64,000			
	1-80,000		131,265 E.T.	
	1-55,000	677,000	20,351 V.C.	525,384
London	5-64,000	320,000		320,000
Arp	2-64,000			
	2-55,000	238,000	57,368	180,632
Van (Van Zandt County)	1-30,000			
	2-64,000	158,000	38,123	119,877
Boggy Creek (Anderson County)	4-55,000	220,000	68,402	151,598
		1,733,000	361,198	1,371,802
Houston Oil Co., Kilgore	4-55,000			
	2-80,000	460,000	43,863	416,137
Amigo	2-80,000	160,000	4,268	155,732
		620,000	48,131	571,869
Magnolia P. L. Co., Longview	2-55,000			
	5-80,000	510,000	197,760	312,240
Center	2-55,000			
	5-80,000	510,000	413,961	96,039
		1,020,000	611,721	408,279
Pure-Van P. L. Co., Van	10-55,000	550,000	324,000	226,000
Republic Prod. Co., Reed Switch	2-80,000			
	2-10,000	180,000	18,856	161,144
Shell Pet. Corp., Kilgore	1-55,000			
	3-80,000	295,000	196,995	98,005
The Texas P. L. Co., Monroe	4- 5,000			
	4-80,000	340,000	185,244	154,756
Joiner	8-80,000			
	2- 5,000			
	3-10,000			
Reed Switch	3-10,000	710,000	57,907	652,093
Douglas Station (Nacogdoches County)	4-55,000	220,000	145,791	74,209
		1,270,000	388,942	881,058
Tidal Ref. Co., Camp Switch	9-55,000	495,000	340,592	154,408
Joiner	3-10,000			
	1-55,000	85,000	36,343	48,657
		580,000	376,935	203,065
Vacuum Oil Co., Camp Switch	3-80,000	240,000		240,000
Major pipe line companies		7,783,000	2,695,005	5,088,095
All others		1,647,500	345,710	1,301,690
Grand total		9,430,500	3,040,715	6,389,785

RECAPITULATION

Counties—	Present stock	Present room	Present capacity
Anderson	51,814	58,186	110,000
Cherokee	16,558	93,442	110,000
Gregg	1,464,996	2,707,004	4,172,000
Nacogdoches	145,791	74,209	220,000
Rusk	435,791	2,604,511	3,040,500
Shelby	413,961	96,039	510,000
Smith	87,861	442,139	430,000
Upshur	61,622	68,378	130,000
Van Zandt	362,123	345,877	708,000
Total	3,040,715	6,389,785	9,430,500

feet. Sampson and others' No. 1 Brock Heirs, top sand 3,627 feet, initial production 125 bbls. per hour pinched through tubing, total depth 3,546 feet. Shell Petroleum Corp.'s No. 4 Spivey, top sand 3,676 feet, initial production 86 bbls. in 30 minutes through open tubing, total depth 3,746 feet. M. A. Corbin No. 1 J. H. Wooley, top sand 3,688 feet, initial production 108 bbls. per hour through three-quarters-inch tubing choke, total depth 3,733 feet. Sun Oil Co.'s No. 1 A. A. King, top sand 3,682 feet, initial production 73 bbls. per hour through three-quarters-inch tubing choke, total depth 3,685 feet. Wheelock & Collins' No. 4 Dick Wells, Base Austin chalk 3,647 feet, initial production 60 bbls. per hour pumping, total depth 3,724 feet.

Arkansas Fuel Oil Co.'s No. 4 Ferguson, top sand 3,622 feet, initial production 140 bbls. per hour through open tubing, total depth 3,645 feet. Arrow Refining Co.'s No. 1 C. Young, junked and abandoned, total depth 3,640 feet. Roy I. Carter's No. 4 Mayfield-Alford, derrick down, location abandoned. W. A. Corbin's No. 1 Motley, top sand 3,758 feet, initial production 125 bbls. per hour through three-quarters-inch tubing choke, total depth 3,767 feet.

Devonian Oil Co.'s No. 3 Alford, top sand 3,748 feet, initial production 85 bbls. per hour through 1-inch tubing choke, total depth 3,769 feet. Same company's No. 6 Milstead, top sand 3,653 feet, initial production 90 bbls. per hour through open tubing, total depth 3,710 feet. East Texas Refining Co.'s No. 4 Ashby, top sand 3,695 feet, initial production 125 bbls. per hour pumping, total depth 3,714 feet. Same company's No. 3 Grissom, top sand 3,679 feet, initial production 30 bbls. in 10 minutes through open tubing, total depth 3,684 feet. Ellzey E. Constantine's No. 1 Deason, top sand 3,620 feet, initial production 47 bbls. per hour through open tubing, total depth 3,681 feet.

Gilcrease and others' No. 3 Bradford, top sand, Base Austin chalk 3,635 feet, initial production 125 bbls. in 6 hours pumping, total depth 3,736 feet. Elzy and others' No. 1 Frederick, temporarily abandoned. Golding & Murchison's No. 2 R. W. Fair, top sand 3,601 feet, initial production 146 bbls. per hour through open tubing, total depth 3,618 feet. Same company's No. 3 R. W. Fair, top sand 3,601 feet, initial production 90 bbls. per hour through open tubing, total depth 3,620 feet. Grayburg's No. 2 Kangerga, top sand 3,650 feet, initial production 100 bbls. per hour through three-quarters-inch tubing choke, total depth 3,662 feet. Humble Oil & Refining Co.'s No. 2 J. H. Arnold, top sand 3,703 feet, initial production 112 bbls. per hour through three-quarters-inch tubing choke, total depth 3,727 feet.

Humble Oil & Refining Co.'s No. 4 M. D. Caldwell, top sand 3,745 feet, initial production 76 bbls. per hour through three-fourths inch tubing choke, total depth 3,765 feet. Same company's No. 5 First Guaranty Bank, top sand 3,685 feet, initial production 119 bbls. per hour through three-fourths inch tubing choke, total depth 3,696 feet. Same company's No. 3-B Kangerga, top sand 3,632 feet, initial production 82 bbls. per hour through three-fourths inch tubing choke, total depth 3,653 feet. Same company's No. 7 Mulliken, top sand 3,630 feet, initial production 46 bbls. per hour through three-fourths inch tubing choke, total depth 3,724 feet. Same company's No. 1 Jessie White, top sand 3,686 feet, initial production 108 bbls. per hour through three-fourths inch tubing choke, total depth 3,785 feet. H. L. Hunt's No. 7-C R. W. Fair, top sand 3,612 feet, initial production 147 bbls. per hour through tubing, total depth 3,623 feet.

Jackson-Wise and Snowden's No. 1 J. H. Stewart, top sand 3,747 feet, initial production 160 bbls. per hour through open tubing, total depth 3,623 feet. Johnson Tract's No. 1 Griffin, top sand 3,638 feet, initial production 100 bbls. per hour through open tubing, total depth 3,705 feet. Lion Oil & Refining Co.'s No. 4-A Brooks, top sand 3,650 feet, initial production 80 bbls. per hour through open tubing, total depth 3,748 feet. M. & G. Oil Co.'s No. 1 Key, top sand 3,814 feet, initial production 240 bbls. per hour through 1-inch tubing choke, total depth 3,819 feet.

Mid-Kansas Oil & Gas Co.'s No. 2 M. C. DeGuerin, top sand 3,659 feet, initial production 170 bbls. per hour through open tubing, total depth 3,679 feet. Same company's No. 2 M. R. Kangerga, top sand 3,606 feet, initial production 120 bbls. per hour through open tubing, total depth 3,637 feet. Same company's No. 6 E. E. Moore, top sand 3,607 feet, initial production 210 bbls. per hour through open tubing, total depth 3,627 feet.

Olsen Brothers' No. 2 J. S. Powers, top sand 3,727 feet, initial production 170 bbls. per hour through three-fourths inch tubing choke, total depth 3,732 feet. Stanolind Oil & Gas Co.'s No. 1-A Shuler, top sand 3,615 feet, initial production 118 bbls. in 3 hours through open tubing, total depth 3,693 feet. Republic Production Co.'s No. 2 Thrash, top sand 3,762 feet, initial production 35 bbls. in 10 minutes through 1½-inch tubing choke, total depth 3,785 feet. Sun Oil Co.'s No. 1 Cooper, top sand 3,614 feet, initial production 72 bbls. per hour through open tubing on 2-inch flow line, total depth 3,669 feet.

The Texas Company's No. 4 First Guaranty State Bank, top sand 3,698 feet, initial production 108 bbls. per hour through open tubing, total depth 3,726 feet. Ward Oil Co.'s No. 6 Thrash, top sand 3,768 feet, initial production 125 bbls. per hour through open tubing, total depth 3,800 feet.

Smith County

Bunte, Inc.'s No. 2 Smith, top sand 3,672 feet, initial production 80 bbls. per hour through open tubing, total depth 3,680 feet. Alex McCutcheon's No. 2 T. O. Wright, top sand 3,696 feet, initial production 125 bbls. in 35 minutes through open tubing, total depth 3,710 feet. C. Edmund Perry's No. 2 T. O. Wright, top sand 3,705 feet, initial production 180 bbls. per hour through open tubing, total depth 3,719 feet. Pugh & Hickman's No. 1 S. S. Cooke, top sand 3,682 feet, initial production 83 bbls. in 10 minutes through open casing with tubing closed, total depth 3,688 feet.

Sinclair Oil & Gas Co.'s No. 9 Dora Wright, top sand 3,758 feet, initial production 80 bbls. in 30 minutes through open tubing, total depth 3,766 feet. Same company's No. 1 Jack Wiley, top sand 3,771 feet, initial production 108 bbls. in 8 hours through open tubing, total depth 3,780 feet. Sun Oil Co.'s No. 5 J. D. Henson, top sand 3,680 feet, initial production 120 bbls. per hour through open tubing, total depth 3,692 feet.

The Texas Company's No. 5 Blackwell, top sand 3,695 feet, initial production 200 bbls. per hour through open tubing, total depth 3,714 feet. Same company's No. 2 A. S. Jarvis, top sand 3,650 feet, initial production 110 bbls. per hour through three-fourths inch tubing choke, total depth 3,654 feet. Same company's No. 3 A. S. Jarvis, top sand 3,454 feet, initial production 115 bbls. per hour through three-fourths inch tubing choke, total depth 3,661 feet.

Upshur County

Atlantic Oil & Production Co.'s No. 4 Moyers, top sand 3,557 feet, initial production 60 bbls. per hour through 1¼-inch tubing choke, total depth 3,581 feet. Cal-Pet Corp.'s No. 2 J. M. Taylor, top sand 3,685 feet, initial production 112 bbls. per hour through three-fourths inch tubing choke, total depth 3,693 feet. Same corporation's No. 5 Walker, top sand 3,630 feet, initial production 50 bbls. per hour through three-fourths inch tubing choke, total depth 3,659 feet. Arkansas Fuel Oil Co.'s No. 2 Victory, top sand 3,627 feet, initial production 100 bbls. estimated per hour through various chokes, total depth 3,648 feet. Eastland Oil Co.'s No. 1 O. M. Victory, top sand 3,640 feet, tested salt water, dry and abandoned, total depth 3,659 feet, top Pecan Gap 2,540 feet, base 2,970 feet, top Austin chalk 3,545 feet, base 3,592 feet. Humble Oil & Refining Co.'s No. 3 J. D. Smith, top sand 3,599 feet, initial production 90 bbls. per hour through various chokes, total depth 3,619 feet.

Magnolia Petroleum Co.'s No. 4 Adkins, top sand 3,713 feet, initial production 100 bbls. per hour through 1-inch tubing choke, total depth 3,719 feet. Same company's No. 9 Free, top sand 3,708 feet, initial production 126 bbls. per hour through 1-inch tubing choke, total depth 3,715 feet. Mitcham and others' No. 1 J. W. Free, top sand 3,665 feet, initial production 125 bbls. per hour through various chokes, total depth 3,684 feet.

Rancho Oil Co.'s No. 2 H. W. Moyers, top sand 3,578 feet, initial production 150 bbls. per hour through open tubing, total depth 3,618 feet. J. J. Roberts' No. 1 Anna L. Jenkins, top sand 3,608 feet, initial production 125 bbls. per hour through various chokes, total depth 3,638 feet. Lewis Sikes and others' No. 1 H. Moyers, top sand 3,642 feet, initial production 125 bbls. per hour through various chokes, total depth 3,654 feet. Sun Oil Co.'s No. 1 T. C. Reney, top sand 3,718 feet, initial production 62 bbls. per hour through open tubing, total depth 3,738 feet.

OLD MAN DEPRESSION DEFEATED BY SEARCH FOR NATURAL GAS IN TIOGA

By Special Correspondent

WELLSBORO, Pa., Nov. 21.—Tioga County, of which this city is the county seat, shows the least degree of unemployment of all the counties of Pennsylvania, according to the Department of Labor and Industry. The natural gas industry is responsible for this good record. Northampton County, in which Bethlehem Steel Co. and other metallurgical industries are located, was the hardest hit by the depression, according to the department's figures. The discovery of gas in Tioga County came early in the period of general depression and the development of the fields, pipe line construction work and other labor incidental to the gas industry kept this county out of the severe slump that has prevailed in other parts of Pennsylvania.

The Lycoming Natural Gas Co.'s No. 1 Hoyt, in the Tioga Field, completed some time ago, recently tested out 9,500,000 feet of gas per day.

The Lycoming Natural Gas Co.'s No. 1 Herrington, in the eastern end of the Tioga County Field, found no gas in the Oriskany sand from 4,093-4,118 feet, but it is not known whether the hole will be drilled deeper. The same company's No. 1 Wheeler was below 5,500 feet with no sand showing.

Hungiville and others' No. 1 Booth, in Hebron Township, Potter County, which was producing 8,000,000 feet per day, has been partly killed. Six joints of pipe which dropped to the bottom of the hole have acted to shut off most of the flow of gas.

The Lycoming Natural Gas Co.'s No. 1 Wheeler, located just south of Wellsboro, was in the Oriskany sand without any gas showing. It may be shot to test the sand.

The North Branch Gas Co.'s No. 1 Colegrove, 10 feet in the Oriskany sand, is making 1,500,000 feet of gas. It is in Lawrence Township, on what is known as the Wellsboro structure.

The Lycoming, Penn United, and Penn-York have drilling wells in Tioga County that will soon be completed.

Over the line in New York State, the Pleasant Valley Gas Wells Syndicate has started a test on the Younglove farm near Hammondsport, Steuben County. The Hammondsport Natural Gas Co. is below 1,000 feet on its test on the Carmon property in the same area. This is wildcat territory.

The Painted Post Oil Gas & Mineral Corp. once drilled a test for oil on the Ayers farm, near Gang Mills, Steuben County, in 1920. It was abandoned as a failure at 1,700 feet. Recently a pump was installed and the water in the hole pumped out. Immediately the well began to produce gas. The casing was left in the hole when it was abandoned 11 years ago. The well will be tested for volume and pressure and if it proves a commercial producer other wells will be drilled. The property is now owned by the Empire-Keystone Oil & Gas Co.

The Producers Natural Gas Co.'s test on the Bluff Point was a failure. It was hoped to extend the Wayne Field with this test.

J. B. Reed and others' No. 1 Houck, in the Wayne gas field is a 2,500,000-foot gas well. It is the ninety-fifth producer in the Wayne Dundee Field.

Five car loads of 10-inch pipe have arrived at Penn Yan and other car loads are at Dundee for the continuation of the Wayne-Penn Yan gas pipe line.

LABORATORY HOUSES RESEARCH EQUIPMENT

(Continued from Page 22)

fuel and lubricant requirements determined for any climatic condition.

In the fuel and lubrication laboratory No. 1 a group of engineers, under J. R. Hill, study problems in detonation on the latest type of equipment. The effect of refining technique and air-fuel ration on knocking tendency is studied and results correlated with actual road performance. Fuel economy tests are run on a variety of engines and acceleration characteristics of various fuels determined. Gruelling tests on the Timken and Mougey machines are run on hundreds of oils and blends, and the high pitched whine of the bearing surfaces is heard as the lubricant begins to fail and metal to metal contact takes place.

In motor laboratory No. 2 another group of engineers, under A. J. Baldwin, may be found giving some car or bus the "gun" on the stationary highway. In another room a laboratory set-up is telling the story of hypoid gear lubricants. Here, too, is seen the assembly for testing lubricants for Tryon shackles, and in the altitude room may be seen some motor operating under mountain air conditions.

A data group, headed by M. H. Rickles, checks and correlates all data on fuels and lubricants. The data so correlated is available to the sales and manufacturing divisions of the company when cleared through this group. Here, too, data sheets are developed covering lubrication requirements of the usual and special machinery of all the basic industries, and definite recommendations made for the most suitable lubricant for any type of equipment.

All maintenance and machine shop work, stores, and non-technical personnel are combined into one group under the supervision of H. R. Tate. This group cares for all maintenance of building and equipment, fabrication of special equipment for specific tests, all orders and storehouse supplies and stenographic and file service.

EXPENSES DEDUCTIBLE

Under a recent ruling of the United States Treasury Department all expenses incurred by attendance, for business purposes, at conventions and other such meetings are deductible from income in making up the federal income tax reports. Costs of exhibits at shows such as the International Petroleum Exposition, and expenses incident to attendance at such shows, for business purposes, are also deductible.

DEATH OF E. C. McCARNES

SAN ANGELO, Tex., Nov. 23.—Edwin Curtis McCarnes, 58, petroleum engineer, formerly production superintendent for the Transcontinental Oil Co. in West Texas and New Mexico, died at his home here. He had oil field experience in a number of foreign countries and is said to have brought in for the Transcontinental in 1925 the first producer drilled with rotary tools in Rumania.

COMBINE TOPPING AND CRACKING IN OPERATION

(Continued from Page 17)

is fractionated in the No. 3 tower which is the same design as the Nos. 1 and 2 towers. The overhead cut is a high anti-knock gasoline which is blended with the gasoline cuts from the topping operation. This cut of cracked gasoline averages from 10 to 12 per cent on the fuel oil charge.

Another important product from this tower is a side cut of zero gas oil. This product has a flash under 170° F., straw color with a gravity 37° A.P.I. The residuum from the tower is a higher flash and cold test and lower gravity gas oil.

Yields

Although the percentage yields will vary depending on the proudcts being marketed by the company the following table is representative and based on actual recoveries for a 24-hour period:

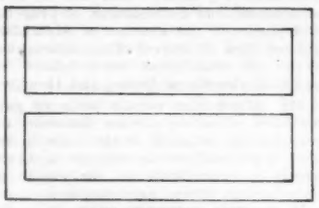
	Per cent
Total gasoline (425 endpoint)	45.97
Kerosene	4.07
Zero gas oil	11.60
Gas oil	23.18
Fuel oil	14.60

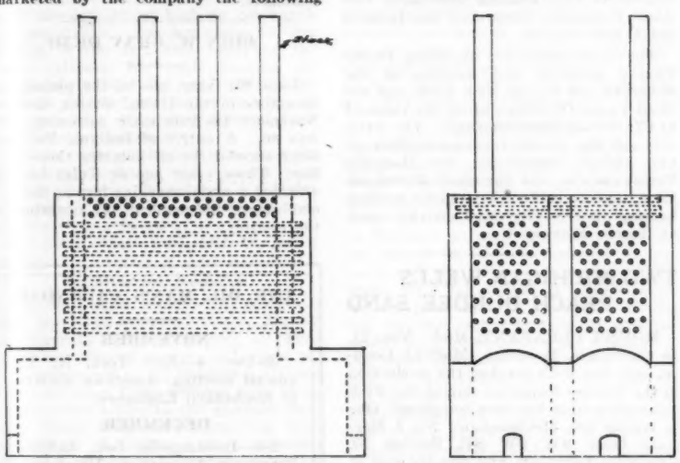
The only treatment required for the products is a caustic sweetening for the blended gasoline. The fuel oil consumption for the combined operations is averaging about 2 per cent.

Cooling Tower

All the cooling of the water takes place in one tower. This tower of Prichard design is 144 feet long, 24 feet wide and 40 feet high. The operation is the same as that at the larger natural gasoline plants. The water from a pond is sprayed in the top of the tower passing through spreaders to the Griscom-Russell bent tube sections where the condensation of all the overhead streams takes place.

This arrangement has given excellent results at the Tyler refinery. The gasoline streams are cooled to exceptionally low temperatures which has reduced vapor losses. The operation is also economical. The water supply is obtained from the city of Tyler. Water from the city mains is used to cool the bearings of the motor equipment and then empties into the pond. It is pumped to the tower from the pond. Two thousand feet of 4-inch pipe in the concrete basin below the tower is used to cool the fuel oil and gas oil streams after they have passed through the heat exchangers. The hot water from the basin overflows directly into the pond.





Diagrams of still and furnace.

Electrical Equ'pment

Starting with the three 7,500-bbl. centrifugal pumps which charge the crude oil at the start of the operation all pumping at the Taylor refinery is handled with motor driven centrifugal pumps of varying capacities and design to meet the requirements of the plant. All hot oil pumping takes place in pump house which adjoins the heat exchangers as shown in the photograph. Other pumping equipment including reflux pumps and loading pumps is located in another pump house. A separate pump house near the pond takes care of the water circulation. An electrically driven air compressor furnishes air for cleaning tubes and other plant uses.

The following electric motors are used in handling the pumping equipment at the refinery: Two 15-horsepower gasoline loading; two 5-horsepower gasoline loading; one 20-horsepower gas oil loading; one 7½-horsepower fuel oil loading; five 7½-horsepower reflux pumps; three 60-horsepower crude oil charging; two 75-horsepower air compressors; one 30-horsepower air compressor; one 7½-horsepower fuel burner; two 150-horsepower charging pumping for cracking stock; three 50-horsepower hot oil transfer; two 75-horsepower water pumps; one 10-horsepower water pump; one 10-horsepower treating pump; one 5-horsepower treating pump; one 5-horsepower trap pump; one 40-horsepower fuel oil pump; one 10-horsepower fuel oil pump; one 30-horsepower fire pump.

DISTILLATION TESTS—EAST TEXAS CRUDE OILS

RUSK COUNTY

Specific gravity, 0.832 ..... A.P.I. gravity, 38.6°
Per cent sulphur, 0.28 ..... Pourpoint, 25° F.
Saybolt Universal viscosity at 100° F., 40 sec ..... Color, greenish black

SUMMARY

	Per cent	Sp. gr.	°A.P.I.	Viscosity
Light gasoline	13.2	0.689	73.9	.....
Total gasoline and naphtha	35.8	.738	60 2	.....
Kerosene distillate	9.7	.817	41.7	.....
Gas oil	15.4	.847	35.6	.....
Nonviscous lubricating distillate	10.1	0.862–0.883	32.7–28.8	50–100
Medium lubricating distillate	5.6	.883–.896	28.8–26.4	100–200
Viscous lubricating distillate	....	....	....	Above 200
Residuum	23.0	.936	19.7	.....
Distillation loss	0.4	....	....	.....

GREGG COUNTY

Specific gravity, 0.833 ..... A.P.I. gravity, 38.4°
Per cent sulphur, 0.26 ..... Pourpoint, 30° F.
Saybolt Universal viscosity at 100° F., 41 sec ..... Color, greenish black

SUMMARY

	Per cent	Sp. gr.	°A.P.I.	Viscosity
Light gasoline	12.3	0.693	72.7	.....
Total gasoline and naphtha	35.0	.741	59.5	.....
Kerosene distillate	10.3	.816	41.9	.....
Gas oil	15.6	.847	35.6	.....
Nonviscous lubricating distillate	10.2	0.860–0 882	33.0–29.3	50–100
Medium lubricating distillate	5.9	.883– 892	29.3–27.0	100–200
Viscous lubricating distillate	....	....	....	Above 200
Residuum	22.5	.955	16.7	.....
Distillation loss	0.5	....	....	.....

NEW YORK STATE LINES MAY EXTEND TO ALBANY

(Continued from Page 28)

known as the New York State Natural Gas Corp.

Another line that will be completed this year is from the Wayne Field in New York State north to Pen Yan, N. Y. This project will ultimately be extended and will be owned by another Lycoming subsidiary known as Keuka Construction Corp.

The Lycoming line to Syracuse will make a connection with the Columbia Gas & Electric gas line which runs across southern New York from Olean to a point near Newark, N. J. An interest in the home companies of Columbia Gas & Electric will be acquired by a new holding company to be known as Lycoming United Natural Gas Corp.

This company is now being organized under the laws of Delaware, capitalization yet undetermined, and will have as its chief subsidiary the Lycoming Natural Gas Corp. This company has been to the forefront in the Tioga Field.

In the new holding company Standard Oil of New Jersey will have more than a 50 per cent interest. Columbia Gas & Electric will own about 30 per cent of the stock and the Benedum-Trees interests of Pittsburgh will own approximately 20 per cent.

Columbia Gas & Electric, along with various leases and wells, is turning in a 30 per cent interest in Belmont Quadrangle Corp. The Benedum-Trees interests are turning in various producing properties in the gas fields. As a result, the new holding company will control 1,500,000 acres of gas lands in Pennsylvania and New York.

The proven open flow of the Tioga County gas field is put at 212,000,000 cubic feet daily, about 23 per cent of which may be put into pipes, according to reliable estimates. Natural gas reserves in the field are between 125,000,000,000 and 135,000,000,000 cubic feet, engineers testified recently before the New York State Public Service Commission. The open flow in the Wayne Field is 125,000,000 cubic feet daily.

In all, Lycoming Natural Gas, through its own wells and purchase arrangements, has virtual control of the gas fields in the States of New York and Pennsylvania. The only important exception is the gas for the line of the Pennsylvania Power & Light Co., which runs from the Tioga Field to the Williamsport, Pa., region. Belmont Quadrangle, also, supplies gas through a line constructed by Iroquois Gas, subsidiary of National Fuel Gas, to the Wayne Field.

Field Potentials

The proved open flow of the Tioga County, Pennsylvania, gas field is around 350,000,000 cubic feet daily, about 25 per cent of which, it is estimated, may be put into pipes daily. Engineers testified before the New York State Public Service Commission, in its current hearings on natural gas development in New York State, that the natural gas reserves in the field were between 125,000,000,000 and 135,000,000,000 cubic feet.

APPOINT SUNBURST RECEIVER

John H. Hamilton of Great Falls, Mont., has been appointed receiver of the Sunburst Oil & Refining Co. The company owns a refinery located at Sunburst.

EAST TEXAS RECOVERY IS OVERESTIMATED

(Continued from Page 13)

of oil daily by pumping or gas lift, but in general the production rate must be regulated by water movement and gas energy left in the sand.

It therefore follows that if 5,000 wells can produce by pumping or other economical methods an average of 100 bbls. of oil per day over a period of six years the average daily production will not exceed 500,000 bbls. per day. To get an average of 100 bbls. of oil daily throughout their life from wells of the type encountered in East Texas will require the application of the best-known production methods and a restricted production rate. Good operators have recognized these requirements for some time and have acted accordingly and in this way seem to be assured a full return on their investments with profit.

Production Costs

It has been estimated by several operators that it will cost about 50 cents per barrel to recover this oil when all charges against the lease have been made. Based upon the above recovery this will mean that it will cost about $579,600,000 to secure this oil and if profit is to be made the oil must be sold for more than 50 cents per barrel, whereas the first 73,000,000 bbls. of oil that has been produced from the field only yielded a net weighted average price of about 35 cents per barrel, or a net loss of 15 cents per barrel based upon the above cost of production. Other companies have placed their average production costs as high as 70 cents per barrel so it would seem that an average of 65 cents per barrel of oil would be quite conservative for all operations.

Well costs have varied over a wide range, but if good practice has been followed the average well has cost about $30,000, therefore the estimated investment in drilling costs for 5,000 wells can be taken as $150,000,000, and to this must be added other items of expense such as bonus for lease, overhead, interest on money and similar items. The $579,600,000 estimated cost of recovery given above covers drilling investment and all other charges including interest and if the 65-cent figure is taken it should be raised to $753,480,000.

Future Production Methods

During the past period of development it has been found necessary in many instances to shut in the well after permitting it to make only a short initial flow because of its size and the amount of tankage available on the lease. If the well flowed three or four hours to clean itself of mud and material in the hole it is now assumed that in many cases the face of the sand has not been thoroughly opened for production.

Following this open flow period it has been necessary to produce the well at restricted rate because of ratable taking of oil in this field and under that condition of production it is further assumed that mud and foreign material may still be in the formation. As long as the well will make its allowable there is little that can be done to remove this foreign matter from the sand pores at the face of the bore hole, but later it is possible that several methods may be tried to remedy this condition and permit the oil to flow more freely into the well.

It has been suggested that a light shot may be tried in some wells to attempt to loosen up the formation and increase flow. So far as known, no wells have been shot thus far, although it is reported that one company will try a shot in a small well that it finished recently and the results will be followed with much interest by all production men.

Recharging the sands with residue gas from gasoline plants will be tried, but as the gas-oil ratio for the average well does not exceed 350 cubic feet per barrel of oil, with the 400,000 bbls. allowable daily production the field is now making it would only mean a total gas production of 140,000,000 cubic feet per day and of this it may be assumed that not over 40 per cent can be returned to

the sand or only about 56,000,000 feet daily.

Based upon a sand thickness of 20 feet and a porosity of 20 per cent, an acre of productive formation would contain about 174,240 cubic feet of pore space and the amount of gas above estimated as available for recharging the sand after being compressed to 1,000 pounds per square inch would only fill a space of about 4.6 acres.

With oil being produced at the rate of 400,000 bbls. per day for the entire field and each barrel of oil occupying about 5.6 cubic feet of space, the total pore space depleted per day would equal about 2,240,000 cubic feet. If each acre of producing formation contains 174,240 cubic feet of pore space this will mean that about 12.85 acres of formation is being depleted per day while the amount of gas available for recharging will fill only 4.6 acres.

As pointed out in an article in The Oil and Gas Journal of September 24, "East Texas Pools Have Peculiar Gas" the oil in this pool does not contain its full quota of gas with which it could be saturated under the pressures and temperatures existing in this pool. The average gas-oil ratio for the pool is about 350 cubic feet of gas per barrel of oil.

Based upon 20 feet of sand, 20 per cent porosity and 90 per cent saturation, each acre of formation would contain about 28,000 bbls. of oil. If 45 per cent recovery is possible this field will yield about 12,600 bbls. of oil per acre or there will be 15,400 bbls. of oil left in the formation into which this gas will be charged. If the oil was not fully saturated with gas in its original state in the formation it would seem that any gas that might be charged into the formation as the oil is being withdrawn will first tend to saturate the remaining oil and it will therefore be some time before it would become effective as a propulsive force to move the oil through the sand to the well.

The effect of the head of salt water that fills the Woodbine sand, which lies beneath the Eagle Ford formation in the central and western zone of the field, will be to maintain a steady pressure upon the oil, and if controlled should serve as a means of moving a vast quantity of oil to the well before the water breaks through and cuts off the remaining oil in the formation.

There are many reasons why gas may be recharged into the formation on a particular lease where its effect can be controlled to some extent and where underground conditions are favorable for such a procedure, and this may be particularly true in the eastern zone of the field where the only energy available for driving the oil to the well is the gas entrapped with it in the formation. Adding gas in such a zone might have the effect of lowering viscosity of the oil and permitting it to flow more freely through the pore space in the sand and in this way reach the well when otherwise it would remain dormant after the first head of pressure had been dissipated.

It has been suggested that intake wells for gas may be drilled with diamond drill outfits and be only slightly larger than the size of tubing to be used for conducting the gas to the producing formation. This idea might be worth investigation, and if the cost of input wells can be materially reduced it should be possible to surround outlet wells with these small repressuring input wells and in that way distribute gas throughout the entire producing zone and get the desired results.

New Equipment Being Installed

Realizing that it is possible that this field will be produced for a long time all major companies have adopted the practice of using only good material and as all usable second-hand equipment has now been used they are buying new casing, tubing, derricks, well head fittings, separators and tanks as well as other items needed for operating these properties.

With over 3,000 wells producing in the East Texas Field and nearly 800 other operations under way there remains to be drilled about 1,500 more wells if the 5,000 estimated as needed are to be drilled. There has been a slowing up in making new locations during the past few weeks due to a number of conditions, but on the other hand there is reported an increased demand for pumping equipment.

As additional wells are drilled into the producing formation all over this vast area the pressure within the sand is being lowered and this will necessitate the installation of mechanical means for securing the additional production. With the original small margin of only about 300 pounds between weight of fluid column and bottom hole pressure and with pressures tending to equalize in the producing formation it is only logical to assume that every added well will increase the rate of reduction of bottom hole pressure and therefore pumping equipment must be installed.

Operators are not anxious to drill additional wells but offset conditions compel them to do so in many instances. They are deferring drilling of inside locations as long as possible, but if the rock pressure within the producing zone continues to fall as rapidly as it has done during the few past months it is going to be almost necessary to drill all wells needed to secure the maximum amount of oil from each lease if these new wells are to be produced in a natural manner during the early part of their life.

It therefore seems quite possible that drilling of new wells will be governed by several things, but the installation of pumping or other producing equipment will have to be resorted to in some areas quite soon for the great number of wells already completed and producing is reducing bottom hole pressure so much that the wells will not continue to flow much longer.

PIPE LINE STOCKS SHOW MORE ACTIVITY

(Continued from Page 96)

ports net loss of $2,357,508 after taxes and charges and after deducting $316,144 loss on sale of property, as compared with a net loss of $195,523 for the first three quarters of 1930.

Panhandle Producing

Panhandle Producing & Refining Co. and subsidiaries report for the quarter ended September 30 net loss of $94,196 after taxes, depreciation, depletion, amortization, intangible drilling costs, inventory adjustments, interest, and minority interest. This compares with net loss of $168,121 in the previous quarter and net loss of $211,430 in the September quarter last year. Net loss for the first nine months of 1931 was $388,874 after the above charges, against net loss of $247,972 in the comparable months of 1930.

Imperial Oil

Imperial Oil, Ltd., declared the regular quarterly dividend of 12½ cents, payable December 1 in Canadian funds to stock of record November 14. Coupon 31 of the 1929 issue is designated for the payment.

TANK WAGON CHANGES

(Continued from Page 94)

throughout its territory in accordance with changes shown in the table here.

Standard Oil Co. of California advanced the retail gasoline price in Phoenix, Ariz., to 17 cents on November 16.

Standard Oil Co. of Indiana advanced the gasoline tank wagon and station price in St. Louis, Mo., on November 18 to 13.9 cents.

Standard Oil Co. of New Jersey advanced the gasoline tank wagon and station prices in St. Louis, Mo., on November 18 to 13.9 cents.

Standard Oil Co. of New Jersey advanced the gasoline tank wagon and station prices one-half cent throughout its territory on November 18.

Continental Oil Co. reduced the gasoline station price to 2 cents in Twin Falls November 6.

ALLRED ISSUES WRITS AGAINST OIL PROPERTY

AUSTIN, Tex., Nov. 23.—Attorney General James V. Allred followed up his $17,850,000 penalty and ouster suit against 15 major oil companies and two oil associations, based on his claims of violations of the Texas antitrust laws in retail operations, with a second plea in Travis County district court for writs of attachment and garnishment of property and stocks to the amount of $1,021,500 against each of several of the companies. Writs of attachment were placed in hands of sheriffs of Dallas and Houston.

Mr. Allred also sought writs of garnishment directing Texas domestic oil corporations involved in the suits to reveal and produce the money and accounts in this State to the credit of their foreign parent organizations.

Writs were sought against Magnolia Petroleum Co., Pasotex Petroleum Co., Shell Petroleum Corp. and the Humble Oil & Refining Co.

The writs called for attaching Dallas County property and holdings of the Standard Oil Co. of New York and the Shell Union Oil Corp., up to the value of $1,021,500 on each company. The writs directed the sheriff to execute them on two Dallas subsidiaries, the Magnolia Petroleum Co. and the Shell Petroleum Corp., and to hold such property pending hearing in the fifty-third district court at Austin January 4.

TWO MICHIGAN WELLS REACH DUNDEE SAND

MOUNT PLEASANT, Mich., Nov. 21. In Greendale Township, Midland County, only two wells reached the production in the Dundee formation during the week although neither has been completed. One is Walter Lee McClanahan's No. 1 Morrison farm, SW SW SE, Section 10, Greendale Township, and directly east of the two big producers on the A. J. Struble farm. This well tapped the first pay sand in the Dundee formation flowing at the rate of 40 bbls. an hour, and will be drilled to the more productive pay in the same formation. The other is the Pure Oil Co.'s No. 2 on the George Lilly 80 acres, S half NE, Section 18, same township, and in the vicinity of where the discovery well opened up the Mount Pleasant-Midland Field a few years ago. No. 2 Lilly was drilled into the Dundee but it is reported the well failed to make more than a show of oil. It is in a field of producing wells and it seemed probable the well would be shot to loosen the "tight sand," in hopes of making it a commercial producer.

The No. 1 Ottway farm well, drilled by the Pacific Oil & Gas Co. in Section 26, Porter Township, southeast of the new East Pool, is reported flowing 75 bbls. a day. There are several tests in the semi-wildcat territory now under way, two of which are scheduled for completion within a very short period.

Walter Lee McClanahan's No. 1 Solms Brothers farm, N half NE, Section 26, Greendale Township, Midland County, about 2 miles southeast of the Struble farm, and Strange-Weller's No. 1 Rheimenschneider farm, Section 14, same township, probably will be completed within a short time. Results of these two wells probably will determine much of the future drilling east and south of the new East Pool.

The department of conservation of Michigan, issued four drilling permits, three in Midland County and one in Gratiot County.

Theodore Oil Co., of Mount Pleasant, Mich., secured a permit to drill No. 1 on the S. M. Robinson farm, SW SW NW, Section 26, Lee Township, Midland County, and 330 feet from the south line and 330 feet from the west line of the lease. A permit was issued to Milfred D. Wells and George Miller of Saginaw to drill No. 1, 300 feet from the south and west lines of the Herman C. C. Thom farm, in the S half SE, Section 9, Lee Township, Midland County. Permit was issued to George Miller and Joe Combe to drill No. 1 I. J. Askegard farm, SE NW NE, Section 9, Elba Township, Gratiot County, 975 feet from the north line and 800 feet from the west line of the farm. Permit was issued to J. M. Markle, trustee, of Mount Pleasant, Mich., to drill No. 1 well, 990 feet from the north line and 660 feet from the east line of the H. Sims farm, NE SE and NE SE, Section 4, Mount Haley Township, Midland County.

REVISE VAPOR PRESSURE TEST

Slight revisions are expected in the final form of the procedure for the Reid vapor pressure test to be included by the Bureau of Explosives as the official procedure for the testing of natural gasoline for shipment. The revisions in the original procedure are minor and simply allow for a greater tolerance in the specifications on the size of the air and gas chambers.

JOHN W. GRAY DEAD

John W. Gray, one of the pioneer oil operators in the United States, died on November 18 from toxic poisoning. He was 86. A native of Indiana, Pa., Mr. Gray entered the oil industry there as a boy. Three years ago at Tulsa he was awarded a medal marking him as the second oldest independent oil operator in the country.

THE OIL MAN'S CALENDAR

NOVEMBER

30-Dec. 4—New York, N. Y., annual meeting, American Society of Mechanical Engineers.

DECEMBER

2-3—Indianapolis, Ind., Indiana Petroleum Association, Hotel Severin.

7-12—Atlantic City, N. J., trade show, motor and equipment—National Standard Parts Association.

9-11—Atlantic City, N. J., American Institute of Chemcial Engineers.

9-11 — Omaha, Neb., Nebraska Petroleum Marketers, Hotel Paxton.

28-31—Tulsa, Okla., Geological Society of America, Mayo Hotel.

1932

JANUARY

9-15—Detroit, Mich., convention and road show, American Road Builders' Association, Airport Building.

9-16—New York, National Automobile Show.

11-12—Fargo, N. D., North Dakota Division, Northwest Petroleum Association, Waldorf Hotel.

14-15—Minneapolis, Minn., Minnesota Division, Northwest Petroleum Association, Radisson Hotel.

25-29 — Detroit, Mich., annual meeting, Society of Automotive Engineers.

30-Feb. 6 — Chicago, Ill., National Automobile Show.

FEBRUARY

9 — Louisville, Ky., Kentucky Petroleum Marketers Association, Brown Hotel.

9-10 — Des Moines, Iowa, eleventh annual convention, Iowa Petroleum Association, Fort Des Moines Hotel.

MARCH

24-26 — Oklahoma City, Okla., American Association of Petroleum Geologists.

APRIL

11-16—Boston, Mass., ninth annual convention, American Oil Burner Association.

21-22—Cleveland, Ohio, semiannual meeting, National Petroleum Association, Hotel Cleveland.

BURNING OILS ARE STRONG IN OKLAHOMA

(Continued from Page 12)

has been accentuated by the greater importance placed on the antiknock ratings of motor fuels. A large part of the gasoline purchased by refiners has been a straightrun grade coming from small skimming plants. This gasoline usually has a low antiknock rating and at best is only suitable as a third retail grade in the operations of the major refiners.

Still another angle is the use of the buyers' or sellers' tank cars in the movement of the purchased gasoline. Most of the larger refiners, during the fall and winter months, have idle tank car equipment and when they make purchases from other refiners they want the shipments made in buyers' cars in order to get the benefit of the mileage allowance of the railroads. The sellers also desire this additional revenue, which in long hauls amounts to as high as one-fourth cent per gallon. Another phase to this problem is the fact that many of the larger refiners, for trade reasons, do not desire to have the cars bearing the names of other refiners unload gasoline at their own bulk stations or those of their regular jobber customers.

Due to these conditions it is doubtful if the larger refiners will adopt a plan of intercompany buying as a regular policy except in rare cases where the gasoline can be purchased at prices substantially below their own cost of manufacture.

Gasoline and Naphtha

Gasoline sales under the prices in effect last week were reported on Monday and Tuesday from practically all Mid-Continent refining groups, which are accustomed to sell on an Oklahoma (Group 3) basis. East Texas refiners have again become more active in the gasoline market. Their sales were competing with the North Louisiana and Arkansas groups of refiners in interstate shipments to southeastern points. They were also offering gasoline to northern buyers, where they were having plenty of competition from refiners in North Texas, the Texas Panhandle and Oklahoma. The Kansas market appeared stronger than the remainder of the Mid-Continent.

It was exceptionally difficult on Monday and Tuesday to determine the going market on any grade. Buyers had sensed the weakness and were slow in making purchases, although important concessions were offered. Offers to sell the U.S. Motor grade with no octane rating went begging among the buyers at 4⅛ and 4¼ cents. At the same time the larger refiners were continuing to quote with occasional sales at 4½ and 4¾ cents. The high octane gasolines were firm at the latter price.

The higher gravities and lower endpoint grades were quoted over wide price ranges. Refiners anxious to sell, sold 400 endpoint as low as 4⅜ cents, 390 endpoint, 4½ cents, and 375 endpoint, 4⅝ cents. The weakness in the natural gasoline market was reflected in the lower prices for 350 and 360 endpoint, both grades selling under 5 cents for the first time this month. The 450 and 437 endpoint blending naphthas were available at a low of 4 cents.

Kerosene

Local and export buying in North Texas, East Texas and North Louisiana continues to absorb the available kerosene in those areas. This leaves the northern market to Oklahoma, Kansas and Middle West refiners where the buying is sufficiently heavy to maintain firm prices. There was ready demand all week for the 41-43 water white grade in Oklahoma at a price range of 2⅛ to 2¼ cents with the 42-44 grade one-eighth cent higher.

Furnace Oils and Gas Oils

The furnace oil demand is a factor in keeping kerosene prices strong. Refiners have no difficulty in moving their low cold test, low flash furnace oils and for that reason they have reduced their kerosene cuts to a minimum. Price ranges on furnace oils are unchanged starting at a low of 2⅝ cents with sales of 38-40 gravity prime white distillate reported as high as 2 cents. Several refiners have furnace oil in storage but they are not willing to sell anything but their current production. They believe that with the arrival of winter weather they will be able to liquidate the storage at higher prices.

The high gravity, low cold test fuel oils are holding their own. Buying is not so heavy as in the case of the regular grades of furnace oils but no distress sales are reported. The industrial low gravity grades moved slowly over the week but prices continue firm.

The so-called industrial and U.G.I. gas oils are fairly active. Those in touch with this market state that the artificial gas plant demand for gas oil will not be as heavy this season as last due to the decreased consumption of artificial gas and the use of heavier fuels in the manufacture of the gas. However, the supplies are limited at this time and this market should strengthen if there is any material decrease in refinery operations over the next several months. The high cold test gas oils are available as low as 1¼ cents with the usual quotation on U.G.I. gas oil at 1⅜ cents.

Natural Gasoline

The decline in natural gasoline demand over the last half of November which was predicted by several market observers has materialized and prices reflect this situation. Prices had declined on Tuesday so that Grade AA was being offered in Oklahoma as low as 3⅞ cents and the BB and C grades at 3¾ cents. With the arrival of colder weather, the production of the latter grades will increase and it is expected that the usual price differentials in relation to the more stabilized Grades AA and A will be established. The Texas market did not decline as much as the Oklahoma market and prices were again practically on a parity the first of the week.

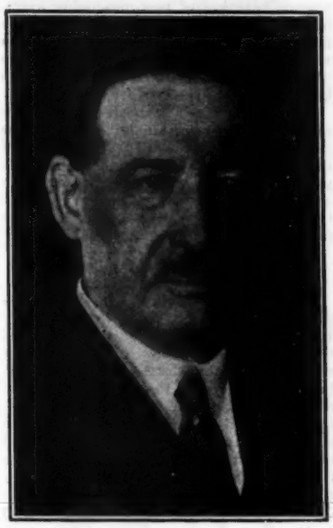
Some of the manufacturers expect the lower prices to attract additional buying unless the refinery market declines rapidly. Reports in the trade state that some important coastwise and export buying is in prospect. Some concern is expressed in the action of at least two large coastal buyers who have served notice that they will reduce their contract purchases the first of the year when the present agreements expire.

Lubricants and Wax

There has been seasonal decline in the demand for lubricants made from Mid-Continent crude oils and it is reflected in the tank car demand. At least two Oklahoma manufacturers have important export orders to ship and they have contracted material which will move later in the year. The range on cylinder stocks, bright stocks and neutral oils is unchanged. The wax market is slow and prices nominal.

JOHN B. BERRYMAN NOW HEAD OF CRANE COMPANY

John B. Berryman has been elected president of Crane Co. to succeed Richard T. Crane, Jr., who died November 7. Mr. Berryman entered the Crane organization 40 years ago as assistant manager of the company's Minneapolis, Minn., branch offices. In 1895 he was transferred to Chicago to take charge of the engineering department, and here his education and ability as an engineer-executive foreshadowed the steady advancement in the organization that was to be his. From the position of assistant secretary of the company, Mr. Berryman became secretary, and in 1914 he was elected first vice president and held this position until he became the executive head of the organization.



John B. Berryman

Under Mr. Berryman's leadership the company will continue the sound policies which marked the strength of Crane Co.'s growth and individuality, it is understood, with the inclusion of those magnanimous principles of employer-employe relationship of which the public at large did not learn until the passing of Richard T. Crane, Jr.

PIPE LINE LEGISLATION BEFORE RIVER CONGRESS

By Charles E. Kern

Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Nov. 21.—Legislation proposed by the railroads for the control of pipe lines, in order to make them less competitive to the railroads, will be one of the outstanding features of discussions before the National Rivers and Harbors Congress to meet in this city December 8 and 9.

The Rivers and Harbors Congress has decided to take notice of the sponsoring of measures by railroads to restrict the operation of buses and trucks, waterways and pipe lines, their chief object being to prevent legislation hampering the further development and use of waterways.

These questions are to be considered in a symposium on "The Future of Transportation." The case of the waterways will be presented by Roy Miller, active vice president of the Intracoastal Canal Association; highways by Ivan Bowen, general counsel Greyhound Lines; airways by F. R. Neely, chief Aeronautic Information Division, Department of Commerce.

Speakers for the railroads and pipe lines have not been announced, but in each case these industries will be represented by men well qualified to uphold their respective rights.

Efforts to place the pipe lines under restrictive legislation were made in Congress in the last session but early in committee hearings in the House of Representatives there was denunciation of these proceedings as a mere attempt on the part of railroads to hamper the carriage of crude oil and gasoline by the cheaper method which has resulted in a great loss of traffic by the raliroads. The net result of legislation for hampering the pipe line industry, it is declared, would be an increase in pipe line rates. Otherwise the railroads would have no interest in seeking legislation, as they are free to construct and operate competing pipe lines.

Secretary of War Patrick J. Hurley will be toastmaster on the occasion of the banquet which will conclude the twenty-seventh annual convention of the congress.

CALIFORNIA CRUDE OIL PRICES

(Continued from Page 93)

ASSOCIATED OIL CO. PRICES

Associated Oil Co. prices effective June 20 are as follows:

Ventura Avenue, 22 gravity, 58 cents, with 2 cents added for each degree upward to and including 30 gravity, which is 74 cents.

Kettleman Hills, 30 gravity and above, 66 cents.

Potrero, 24 gravity, 69 cents, with 2 cents added for each degree upward to 34 gravity, which is 69 cents.

UNION OIL CO. OF CALIFORNIA

Crude Oil Prices for Its Purchases at the Well for Crude Produced in Strict Accordance With the Production Allocations Made by the California Statewide Curtailment Committee Effective 7 a.m., June 20, 1931

(All gravities above these quoted take highest price for that field)

Gravity °A.P.I.	Signal Hill	Alamitos Heights, Seal Beach	Huntington Beach	Athens, Rosecrans, Domingues	Torrance	Santa Fe Springs	Playa Del Rey*	E. Coyote, Richfield	Montebello	Santa Paula	Orcutt	Coalinga	Lost Hills	McKittrick, Kern River, Sunset-Midway, Elk Hills, Buena Vista Hills	Gravity °A.P.I.
11-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	$.50	11-13.9
14-14.9	$.65	$.65	$.65	....	$.65	....	....	$.65	$.65	$.65	$.55	$.55	$.55	.55	14-14.9
15-15.9	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	15-15.9
16-16.9	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	16-16.9
17-17.9	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	17-17.9
18-18.9	.65	.65	.65	....	.65	....	....	.65	.65	.65	.55	.55	.55	.55	18-18.9
19-19.9	.65	.65	.65	....	.65	....	$.65	.65	.65	.65	.55	.55	.55	.55	19-19.9
20-20.9	.65	.65	.65	....	.65	....	.65	.65	.65	.65	.56	.55	.55	.55	20-20.9
21-21.9	.65	.65	.65	....	.65	....	.66	.66	.65	.65	.57	.55	.57	.55	21-21.9
22-22.9	.65	.65	.65	....	.66	....	.67	.67	.65	.65	.59	.56	.59	.56	22-22.9
23-23.9	.67	.67	.67	....	.67	....	.68	.68	.65	.65	.61	.55	.60	.58	23-23.9
24-24.9	.69	.69	.69	$.69	.68	$.65	.69	.69	.65	.66	.63	.55	.62	.61	24-24.9
25-25.9	.71	.71	.71	.71	.70	.65	.70	.70	.65	.68	.65	.57	.64	.64	25-25-9
26-26.9	.73	.73	.73	.73	....	.65	....	.72	....	.70	.67	....	.66	.66	26-26.9
27-27.9	.75	.75	.75	.75	....	.68	....	.74	....	.72	....	....	.67	.68	27-27.9
28-28.9	.77	....	....	.77	....	.71	....	....	....	.74	....	....	.69	.71	28-28.9
29-29.9	.79	....	....	.79	....	.73	....	....	....	.76	....	....	.71	.74	29-29.9
30-30.9	.81	....	....	.81	....	.75	....	....	....	.78	....	....	.72	.76	30-30.9
31-31.9	....	....	....	.83	....	.78	....	....	....	....	....	....	....	....	31-31.9
32-32.9	....	....	....	.85	....	.80	....	....	....	....	....	....	....	....	32-32.9
33-33.9	....	....	....	.87	....	.83	....	....	....	....	....	....	....	....	33-33.9
34-34.9	....	....	....	.89	....	.85	....	....	....	....	....	....	....	....	34-34.9

*Subject to a gathering charge of 5 cents per barrel.

Ratable Ownership Plan to Be Prepared By A.P.I. Committee

By A. E. Mockler

NEW YORK, Nov. 23.—Prompt action in the formulation of a definite and comprehensive plan for the application of the equitable and ratable ownership plan to the American oil industry will be sought by a committee of 11 prominent oil men, under the chairmanship of Charles F. Roeser, well-known independent producer of Fort Worth, appointed here by Judge Amos L. Beaty, president of the American Petroleum Institute.

Besides Mr. Roeser, the committee is composed of J. Edgar Pew, Sun Oil Co., Philadelphia; W. N. Davis, Phillips Petroleum Co., Bartlesville, Okla.; W. P. Z. German, Skelly Oil Co., Tulsa; Oscar Sutro, Standard Oil Co. of California, San Francisco; C. B. Ames, The Texas Company, New York; W. S. Farish, Humble Oil & Refining Co., Houston, Tex.; Wirt Franklin, Wirt Franklin Petroleum Corp., Ardmore, Okla.; A. W. Peake, Standard Oil Co. of Indiana, Chicago; E. B. Reeser, Barnsdall Corp., Tulsa, and R. E. Hardwicke, Fort Worth, Tex., attorney.

The committee includes both practical, experienced production men and lawyers thoroughly familiar with the major troubles confronting the production division of the industry, and is charged with reporting within 60 days on a practical and comprehensive plan to be based on the principle that "each owner of the surface is entitled only to his equitable and ratable share of the recoverable oil and gas energy in the common pool in the proportion which the recoverable reserves underlying his land bear to the recoverable reserves in the pool," the foregoing being the substance of a resolution adopted at the recent Chicago convention of the A. P. I.

The industry in past years has suffered enormously from the effects of overexploitation of new producing areas, both in the resultant glutting of the crude market with the flush production from these pools, and the costly duplication of aboveground effort in the scramble to bring the oil to the surface.

The committee's report, when completed, probably within 60 days, will be submitted to the board of directors of the institute for action, after which it is planned to conduct an intensive drive to secure the legislation necessary to make the plan fully operative and effective in the various oil producing states.

STREAMBED LAW TEST

AUSTIN, Tex., Nov. 23.—Mandamus suit was filed in Supreme Court Monday by District Judge Harry Dolan, of Georgetown, testing the Act of 1929 that withdrew streambed lands from oil leasing, and indirectly testing the new law effective January 1, to restore the leasing. He asked a mandamus to compel the survey of land in the Sabine River bed in the East Texas oil field of Gregg County, with a view of fixing a preferential right to purchase the lease at a price to be fixed by the land commissioner, rather than the new board to function after January 1.

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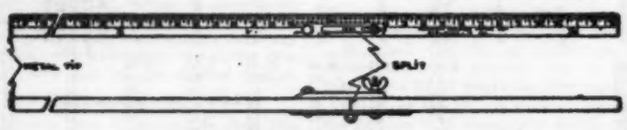

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CHARLES L. BULLOCK, GAS EXECUTIVE, DEAD

Charles L. Bullock, 72, president of the Wichison Industrial Gas Co., died Monday, November 16, in Wichita, Kans. He had been ill since October 13.

In 1887 Mr. Bullock went into the natural gas business in Pennsylvania. He rapidly became an important figure in the industry and built and operated systems in that State, New York and Ohio.

Upon his arrival in eastern Kansas about 35 years ago, Mr. Bullock helped to build up the old Kansas Natural Gas Co., a firm whose system extended over that part of the State.

Later Mr. Bullock joined the firm of Henry L. Doherty and was stationed in Bartlesville, Okla., in an executive capacity. For some years he was in charge of distribution in Wichita, Eldorado and other Kansas cities.

It was in 1924 that Mr. Bullock organized the Wichison Industrial Gas Co. and the Larutan Company. The Wichison soon became an important factor in the industrial life of Wichita, its lines running throughout the city. It also operates in Hutchinson. The source of the gas was the Deer Creek and Blackwell Fields.

Late Fields

(Continued from Page 24)

depth of 3,487 feet was shut down.

During the last 60 days 59 old wells have been plugged and abandoned in the Greater Seminole area. These exhausted producers included two gas wells and three were combination oil and gas producers and the remainder were producing wells that were making more water than it was profitable to handle under the present market prices. The Carter Oil Co. abandoned 17 wells, Gypsy Oil Co. plugged 9, Magnolia Petroleum Co. and Prairie Oil & Gas Co. plugged 6 each, and Sinclair Oil & Gas Co. plugged 5 wells.

In Stephens County in the southern part of the State, Murray Petroleum Co.'s No. 1 Wilkerson, SE cor. NE SE, Section 8-1s-5w, found water in the sand at 1,070-87 feet and is plugging back to an upper sand where a showing of oil was found at 998-1,028 feet. Other showings were found at 370-85 feet and at 295-300 feet. H. J. Brown's No. 2 Hightower, SE cor. NE, Section 15-3s-5w, found a showing of oil at 850-52 feet and was drilling deeper at 870 feet. W. J. McAlister and others' No. 1 A. Voss, SW cor. NE SW, Section 28-1s-8w, was landing 8-inch casing at 909 feet on top of a gas sand. G. Pace's No. 1 Pace, NW cor. SE SE, Section 18-2s-7w, is a rotary rig.

STERLING NAMED IN SUIT

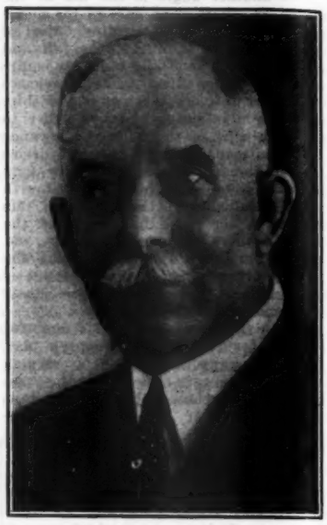
SHERMAN, Tex., Nov. 23.—Counsel for the Brock-Lee Oil Co. filed an amended petition with Federal Judge Randolph Bryant seeking an injunction against enforcement of proration of the company's East Texas oil wells. The amended petition attacks as unconstitutional Gov. R. S. Sterling's proration orders in the East Texas martial law area issued since a temporary injunction was granted a month ago. The hearing will be held January 4.

ROYAL ROYALTIES LIMITED

Royal Royaltics, Ltd., a new oil royalty company with an authorized capitalization of 1,000,000 shares of no par value, was incorporated under Colorado laws on November 12. The directors are Max W. Ball, Paul P. Presser, Roy Holloman, F. R. Cassidy, H. C. McKinstry and E. M. Carlson of Denver, and Arthur Rich of Ponca City, Okla. The officers are Max W. Ball, president; F. R. Cassidy and Arthur Rich, vice presidents, and Russell Murray, secretary. The company will engage in a general royalty business, concentrating its activities mainly in Oklahoma, Kansas, Texas and New Mexico.

Pipe Line Official Retires to Become County Treasurer

OIL CITY, Pa., Nov. 21.—Thomas L. Blair, mayor of Oil City, Pa., and a member of the board of directors of the National Transit Co., the National Transit Pump & Machine Co., and the Maryland Pipe Line Co., and recently elected



Thomas L. Blair

county treasurer of Venango County, will retire as a director of the pipe line company and its affiliated organizations on November 30 and will retire as mayor on January 4, 1932, to assume his duties as county treasurer.

Mr. Blair entered the service of the National Transit Co. on April 1, 1896, under Major John B. Maitland. Shortly afterward he was sent to the Ohio oil fields, Findlay district, to inspect tanks, and after completing this work he returned to Oil City and served as a clerk until the death of Major Maitland. He was made chief clerk of the right of way department under C. E. Colling. He was named as Mr. Colling's successor following the death of that official in December, 1917, and in October, 1918, was made a member of the board of directors of the company. He will go on the pension list on January 1.

UNIVERSITY OF TEXAS TO CONSERVE ITS OIL

AUSTIN, Tex., Nov. 23.—The University of Texas will collect oil revenues and keep its oil intact for future better prices. The university oil leasing board in session here extended 39 oil leases in Andrews, Crane and Ector Counties, under which the university will continue to derive rentals for five years, and drilling of the areas will be postponed, probably until the end of the period. The leasing board wished to discourage drilling, and will withhold other leases from the market indefinitely, members said. The 39 leases would have expired in December, and had they not been extended, the holders would have been forced either to drill or to surrender the leases.

A scheduled conference on gas waste in the Reagan County Field was postponed because of the absence of Chairman R. L. Batts from Austin.

CHICAGO POST OFFICE BIDS

CHICAGO, Nov. 24.—The Chicago post office is asking for bids today on 275,000 gallons of gasoline for first quarter of next year. For the first time octane ratings are included in the specifications. Tank car markets show the price spread between octane classifications widening.

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DON'T MISS AN ISSUE

The Oil and Gas Journal

TULSA, OKLA.

MEXICAN COMPANY MAY SHUT DOWN REFINERY

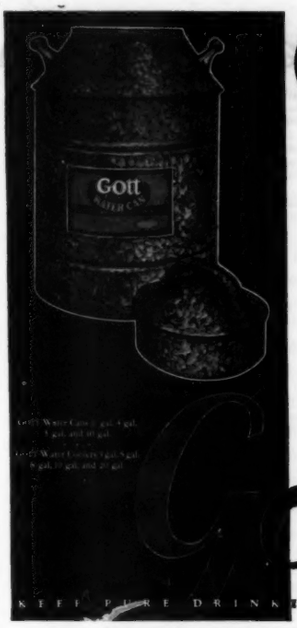
NEW YORK, Nov. 23. — Compania Mexicana De Petroleo El Aguila has applied to the Mexican federal board of arbitration and conciliation for authorization for a temporary shutdown of its producing operations along the Isthmus of Tehuantepec as well as closing down of its large refinery there, according to a copyrighted cable to the Herald-Tribune today. Lack of demand for refinery products is given as the principal reason for the contemplated shutdown. Stoppage of the large tanker transit over the Coatzacoalcos River, the principal connecting link between Aguila's refinery and the Gulf of Mexico, caused by a rise in the river bottom, is another reason given by the company for the shutdown. Strenuous opposition from Mexican labor unions is looked for.

CALIFORNIA GEOLOGISTS

LOS ANGELES, Calif., Nov. 21.—At the eighth annual meeting of the Pacific section of the American Association of Petroleum Geologists, held here Carrol F. Wagner, chief geologist of the General Petroleum Corp., was elected president, and Herschel L. Driver, micropaleontologist with the Standard Oil Co. of California, was elected secretary-treasurer. Mr. Wagner succeeds M. G. Edwards, geologist with Shell Oil Co., and Mr. Driver succeeds Louis N. Waterfall, geologist with the Union Oil Co.

LEGAL

Call for Bids to Purchase Royalty Oil Accruing to the United States from the Salt Creek, Wyoming, oil field. Pursuant to the provisions of Section 36 of the act approved February 25, 1920 (41 Stat., 437), sealed proposals, in duplicate, will be received in the office of the Secretary of the Interior, Washington, D. C., on or before noon on December 1, 1931, from responsible bidders for the purchase, for a period beginning January 1, 1932, of all royalty oil accruing to the United States from Government lands in the Salt Creek, Wyoming, oil field. For the calendar year 1930 the total Government royalty oil from Salt Creek field amounted to approximately 1,325,000 barrels, and for the period from January 1 to July 31, 1931, to approximately 666,000 barrels, about 14 per cent of the production of the field, the average gravity in both years being in the range from 36.0 to 36.9 degrees A. P. I. Additional information may be obtained from the Director, Geological Survey, Department of the Interior, Washington, D. C., or the Supervisor, Geological Survey, Casper, Wyoming. Bids are invited on three separate items as follows: Item 1 Royalty oil for the period beginning January 1, 1932, and ending December 31, 1932. Item 2. Royalty oil for the period beginning January 1, 1932, and ending December 31, 1934. Item 3. Royalty oil for the period beginning January 1, 1932, and ending December 31, 1936. Bids must be in the following form: "For the period beginning January 1, 1932, and ending December 31, 193.., (name of bidder), offers ..... cents per barrel above the highest field price for oil of equal or lower gravity in Oklahoma and Kansas, and/or in Wyoming, whichever is the higher, as published or offered by any responsible recognized purchaser for crude oil in quantity not less than 2,000 barrels a day." Delivery of royalty oil will be made in the field without cost to the Government to the successful bidder or for his account. Payments for the royalty oil are to be made to the Register of the United States Land Office, Cheyenne, Wyoming, on or before the fifteenth day of each month following that in which delivery is made. The quantity and quality of the oil will be determined by tank measurement and suitable tests, the measured quantity will be corrected for impurities in excess of one-half of one per cent, and the volume computed in terms of standard barrels at 60° F. Each bidder must submit with his bid a bond in the sum of 01,000 or a certified check payable to the order of the Secretary of the Interior in the sum of $1,000 as a guarantee that he will, if successful, promptly execute a satisfactory contract and furnish a bond in the sum of at least $250,000, conditioned upon full and complete compliance with the terms of the contract. The Secretary of the Interior may accept the offer of the highest bidder and/or bidders and reserves the right to reject all bids whenever within his judgment the interest of the United States demands. Storage facilities are available on Naval Petroleum Reserve No. 3, Wyoming (Teapot), for approximately 1,500,000 barrels of oil. Information in regard thereto may be obtained from the Secretary of the Navy. Sealed bids are to be submitted to the Secretary, Department of the Interior, Washington, D. C., the envelope to be marked plainly "Bid on Salt Creek royalty oil." No bid received after the time herein fixed for submitting bids will be considered. Ray Lyman Wilbur, Secretary of the Interior. October 21, 1931. (P. N. 57694).



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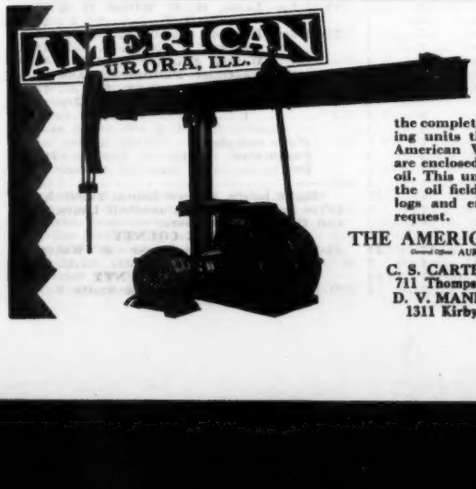

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Detailed Operations for All Fields for October, 1931

SUMMARY OF ALL FIELDS
Wells Completed

	Comp.	Prod.	Dry	Gas
Eastern	133	265	16	38
Central Ohio	58	206	13	32
Lima	24	84	4	13
Indiana	8	0	6	2
Michigan	15	9,550	4	6
Kentucky	21	518	2	7
Illinois	2	2	1	0
Kansas	38	11,287	8	9
Oklahoma	57	144,241	23	11
North Central Texas	60	1,142	32	5
E. Cent. and E. Tex.	469	58,169	23	0
East Texas gas field	8	0	8	0
West Texas	12	2,120	8	0
Panhandle Texas	8	1,835	0	4
Gulf Coast	32	19,483	9	1
Southwest Texas	29	4,799	16	2
North Louisiana	21	1,117	9	4
Arkansas	2	1,450	0	0
Mississippi	8	0	3	5
Montana	3	0	0	3
Wyoming	6	180	4	0
Colorado	2	930	0	0
New Mexico	3	75	2	0
Total October	1,020	257,605	186	142
Total September	799	167,782	218	147
Difference	221	89,823	32	5

The initial production of the various pools in the East Texas area represents only the first hour's or fractional part of an hour's production, as the wells are permitted to flow only a short time in conformance with the State's curtailment orders, or for other reasons. In some instances no gauge whatever is taken on the initial brief flow of the wells. None of the oil companies is keeping even an estimate on potential initial production in the East Texas field.

Rigs and Wells Drilling

	Rigs	Drlg.	Ttl.
Eastern	51	213	264
Central Ohio	29	94	123
Lima	1	15	16
Indiana	7	55	62
Michigan	70	96	166
Kentucky	10	75	85
Missouri	0	1	1
Tennessee	0	14	14
Illinois	2	17	19
Kansas	22	112	134
Oklahoma	53	217	270
North Central Texas	35	93	128
E. Central and E. Texas	232	424	656
East Texas gas field	5	35	40
West Texas	14	72	86
Panhandle Texas	15	36	51
Gulf Coast	12	83	95
Southwest Texas	10	106	116
North Louisiana	10	58	68
Arkansas	8	28	36
Mississippi	10	19	29
Alabama	2	3	5
Montana	17	69	86
Wyoming	9	74	83
Colorado	13	84	97
New Mexico	6	53	59
Utah	1	19	20
Total October	644	2,165	2,809
Total September	611	2,179	2,790
Difference	33	14	19

Note—In the following report the Section, Township and Range are given first; then the farm, the owner, the serial number of the well and the initial production of the well. In lines where the Section, Township and Range are missing the wells are located in the Sections, Townships and Ranges which appear next above in the report.

OKLAHOMA FIELDS

Summary of Rigs and Wells Drilling

County—	Rigs	Drlg.	Ttl.
Alfalfa	0	2	2
Atoka	2	1	3
Beckham	1	3	4
Blaine	0	1	1
Bryan	0	1	1
Caddo	0	4	4
Canadian	0	1	1
Coal	0	2	2
Carter	1	3	4
Cherokee	0	1	1
Cleveland	1	0	1
Comanche	0	3	3
Creek	12	29	41
Garfield	2	2	4
Garvin	0	1	1
Greer	0	2	2
Grant	1	1	2
Hughes	0	1	1
Haskell	0	3	3
Jefferson	0	1	1
Kay	0	4	4
Kiowa	0	2	2
Latimer	0	2	2
LeFlore	0	1	1
Lincoln	0	2	2
Logan	0	3	3
Love	0	1	1
McIntosh	0	2	2
Marshall	0	5	5
Murray	0	1	1
Muskogee	3	8	11
Noble	1	7	8
Okfuskee	1	6	7
Oklahoma	10	47	57
Okmulgee	1	13	14
Osage	3	4	7
Pawnee	2	11	13
Payne	0	2	2
Pittsburg	2	3	5
Pontotoc	0	4	4
Pottawatomie	2	1	3
Roger Mills	0	2	2
Seminole	2	2	4
Sequoyah	0	1	1
Stephens	3	5	8
Tulsa	2	6	8
Washita	0	2	2
Wagoner	1	8	9
Total October	53	217	270
Total September	50	213	263
Difference	3	4	7

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Creek	8	470	3	2
Johnston	1	0	1	0
Kiowa	1	0	1	0
LeFlore	1	0	0	1
Lincoln	1	0	1	0
Marshall	2	0	2	0
Muskogee	6	0	2	4
Oklahoma	18	143,676	2	0
Osage	1	0	1	0
Okmulgee	4	58	2	0
Pawnee	5	9	3	2
Pittsburg	1	0	0	1
Stephens	2	35	1	0
Wagoner	5	0	4	1
Tulsa	1	16	0	0
Total October	57	144,241	23	11
Total September	61	93,427	27	12
Difference	4	50,814	4	1

WELLS COMPLETED

CREEK COUNTY

24-19- 8 McGee, Wesfall Drlg. Co. 1-A 50
7-19-10 V. Barnett, Burton & Holmes 2 ..... dry
17-16- 8 Posey, National Investers Co. 1 400
16-16-11 Vierson, S. J. Mathews et al 1 gas
19-17-10 Littlehead, Curtis Oil Co. 1.. gas
3-16- 7 Talomasse, Magnolia Pet. Co. 1 dry
12-18-11 Land, O. C. Baltzell et al 1.. 20
22-17-11 Thompson, Carpenter et al 2 dry

Wells completed 8
Production 470
Dry 3
Gas 2
Gas production 3,250,000

JOHNSTON COUNTY

17-4s- 5 Rearidan, F. E. Galbrith 1.. dry

KIOWA COUNTY

1- 6-15w Grigsby, Arrasmith & Walker 1 ..... dry

LEFLORE COUNTY

26- 7-26 Robbs, Sonner O. & G. Co. 1 gas

Gas production 750,000

LINCOLN COUNTY

6-14- 4 Cash, Magnolia Pet. Co. 1.. dry

MARSHALL COUNTY

15-5s- 6 Ward, D. H. Curry 1..... dry
10-5s- 5 Rice, M. A. Neff 1..... dry

Wells completed 2
Dry 2

MUSKOGEE COUNTY

2-15-18 Benge, R. A. Godfrey et al 1 gas
15-14-16 M. Doyle, Bryan Pet. Co. 1-A dry
17-13-16 J. Jackson, Wineland et al 1 gas
35-16-15 Grayson, R. B. Hash et al 1 gas
18-15-15 Ware, Taylor & Geiger 1-A dry
13-14-16 Refinberry, Bryan Pet. Co... gas

Wells completed 6
Dry 2
Gas 4
Gas production 13,650,000

OKLAHOMA COUNTY

3-11-3w Central, T. B. Slick estate 4 *257
2-11-3w Polin, Laco Pet. Co. 1... dry
3-11-3w Classen - Edwards, T. B. Slick estate 6 ..... †4,498
34-12-3w Whitfield, T. B. Slick estate 2 ..... ‡7,785
3-11-3w Terminal, T. B. Slick estate 2 ..... §8,972
Butcher, H. F. Wilcox and Marshall & Butcher 1..*13,076
10-11-3w Burrouns, T. B. Slick estate 2 ..... *12,243
15-11-3w Wheeler, Sunbeam Oil Co.. ‡4,638
3-11-3w Classen - Edwards, T. B. Slick estate 2 ..... *10,988
Curtis, T. B. Slick estate and Wofford Drlg. Co. 1.*16,808
Terminal, T. B. Slick estate 1 ..... §5,423
2-11-3w Jones, S. M. Stauffer, trustee, 1 ..... §13,550
3-11-3w King, Denver P. & R. Co. 1 ..... *12,196
10-11-3w Lowe, H. F. Wilcox O. & G. Co. 1 ..... §5,649
15-11-3w Danbold, Anderson, Kerr et al 1 ..... *11,528
Weinig, Stauffer et al 1... *9,941
23-11-3w Egermier, Phillips Pet. and Shell Pet. Corp. 1..... ¶6,124
34-11-3w Community, Ben Head, Jr., 1 ..... dry

Wells completed 18
Production 143,676
Dry 2

*Eight hours. †Three hours. ‡Four hours. §Five hours. ¶Six and one-half hours. ¶Six and three-fourths hours.

OSAGE COUNTY

26-21- 9 Oklahoma Power & Water Co. 133 ..... dry

OKMULGEE COUNTY

31-16-12 Sharp, Shamblin & Smith 1.. 20
36-16-14 Anderson, Mack Drlg. Co. 1-A 30
9-15-13 Brown, Kirkland & Son 7... dry
19-15-14 Harrison, A. W. Cline 8..... dry

Wells completed 4
Production 50
Dry 2

PAWNEE COUNTY

3-20- 6 Newell, Privett Drlg. Co. 1.. dry
2-22- 5 Millsap, Sherry et al 1..... dry
27-21- 8 Nielson, Arkansas Utility Co. 1-A ..... gas
9-20- 9 Tate, M. R. Jensen 3..... dry
14-20- 9 Twedy, T. E. Harris et al 1.. gas

Wells completed 5
Dry 3
Gas 2
Gas production 5,750,000

PITTSBURG COUNTY

5- 8-16 Mattox, J. E. Welble 1..... gas

Gas production 3,750,000

STEPHENS COUNTY

34-1s-3w Dexter, American Pipe Line Co. 7 35
13-2s-3w McMasters, George Pace et al 12 ..... dry

Wells completed 2
Production 35
Dry 1

WAGONER COUNTY

7-15-17 B. Shepard, C. D. Bradley et al 1 ..... gas
6-17-15 Apueka, F. D. Heishell 2.... dry
13-17-15 Haney, Boley et al 1-A..... dry
7-16-17 A. Adams, A. W. Swift 1... dry
15-17-16 Verner, L. Price et al 3..... dry

Wells completed 5
Dry 4
Gas 1
Gas production 7,000,000

TULSA COUNTY

2-18-13 Brooks, Mays Drlg. Co. 5.... 10

KANSAS FIELDS

Summary of Rigs and Wells Drilling

County—	Rigs	Drlg.	Ttl.
Barton	0	3	3
Bourbon	0	1	1
Butler	1	1	2
Chase	1	1	2
Clark	0	1	1
Clay	0	1	1
Coffey	0	2	2
Cowley	2	5	7
Dickenson	0	1	1
Ellis	0	1	1
Ellsworth	1	4	5
Finney	0	1	1
Ford	0	3	3
Franklin	0	1	1
Greenwood	1	12	13
Graham	0	1	1
Harvey	1	3	4
Kingman	1	0	1
Marshall	0	1	1
McPherson	7	39	46
Marion	0	2	2
Morris	1	3	4
Morton	0	1	1
Osage	0	1	1
Rawlins	0	1	1
Reno	1	1	2
Rice	2	4	6
Rush	0	1	1
Russell	1	3	4
Saline	0	1	1
Sedgwick	1	4	5
Sheridan	0	1	1
Stafford	0	1	1
Stevens	0	1	1
Sumner	0	3	3
Trego	0	1	1
Washington	0	1	1
Woodson	1	0	1
Total October	22	112	134
Total September	18	109	127
Difference	4	3	7

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Butler	2	50	0	1
Chautauqua	1	0	1	0
Cowley	3	5	2	0
Ellis	1	325	0	0
Ellsworth	1	0	1	0
Greenwood	2	371	0	0
Haskell	1	0	0	1
Harper	1	0	1	0
McPherson	17	9,296	0	5
Rice	1	0	1	0
Russell	2	436	0	0
Sedgwick	3	905	1	0
Stevens	2	0	0	2
Sumner	1	0	1	0
Total October	38	11,287	8	9
Total September	25	3,643	9	8
Difference	13	7,744	1	1

WELLS COMPLETED

BUTLER COUNTY

30-26- 5 Koogler, Magnolia Pet. Co. 67 50
27-28- 4 Martin "B," Flint Hill O. & G. Co. 1 ..... gas

Wells completed 2
Production 50
Gas 1
Gas production 1,000,000

CHAUTAUQUA COUNTY

36-34- 9 Lemert, Leighty and Prairie O. & G. Co. 3 ..... dry

COWLEY COUNTY

1-33- 4 Graham, Lehman et al 1..... 5
6-33- 5 Wallace, Smith et al 1..... dry
36-32- 4 Page, Lehman et al 1..... dry

Wells completed 3
Production 5
Dry 2

ELLIS COUNTY

36-12-16w Welland, Gypsy Oil Co. 1.... 325

ELLSWORTH COUNTY

6-14-9w Kasper, Milton et al 1..... dry

GREENWOOD COUNTY

28-23-11 Beal, Phillips Pet. Co. et al 8 200
27-23-11 Ellis, Stanolind O. & G. Co. et al 6 171

Wells completed 2
Production 371

HASKELL COUNTY

29-30-24w Warner, Trees et al 1..... gas

Gas production 13,600,000

HARPER COUNTY

21-31-6w Bear, Beeler et al 1..... dry

McPHERSON COUNTY

20-19-1w Overman, Harris & Haun 2.. gas
19-19-1w Gratton, Twin Drlg. Co., Phillips Pet. and Shell 1..... 346
31-19-1w Sellers, Lario Oil Co. and Shell Pet. Corp. 1.....2149
25-19-2w Krehbiel, Wolf Creek Oil and Sinclair O. & G. 1..... gas
36-19-2w Becker, Syndicate O. & G. and Shell Pet. 2 1515
2-20-2w Decker, Shawver and Shell Pet. Corp. 1 486
16-19-1w Fletcher "C," Darby Pet. Corp. 1 ..... gas
20-19-1w Kaegi, Darby Pet. and Shell Pet. 3 ..... gas
23-19-2w Knudson, Rosenthal et al 1.. 50
19-19-1w Sellers, Dieter, Youker and Shell Pet. Corp. 2.....1216
30-19-1w Garrett, Abilene Oil and Shell Pet. 1 680
24-19-2w Boal, Lario Oil Co. and Shell Pet. 1 1483
3-21-3w Morehouse, Phillips Pet. Co. 1 100
19-19-1w Ritz, Rosenthal & Beardmore 2 1211
13-19-2w Holt, Carey and The Texas Company 1 35
27-20-3w Stucky, Slick, Pryor and Lockhart 1 ..... gas
Gratton, Slick, Pryor and Lockhart 1 25

Wells completed 17
Production 9236
Gas 5
Gas production 91,002,000

RICE COUNTY

22-18-9w Guldner, Yarnett and Shell Pet. Corp. 1 ..... dry

RUSSELL COUNTY

30-14-12w Miller, Stearns & Streeter and Hall 1 185
26-15-13w Sellens, Signal Oil Co. 1..... 250

Wells completed 2
Production 1483
Gas 435

SEDGWICK COUNTY

16-25- 1 Black, Continental Oil Co. 1 205
19-27- 2 Wheeler, Magnolia Pet. Co. 6 700
19-27- 2 Joe Houston, Van Martin, Lancaster and Davidson 1. dry

Wells completed 3
Production 905
Dry 1

STEVENS COUNTY

19-33-36w Paden, Saxet Corp. 1..... gas
36-33-35w Hallock, McKnabb et al 1... gas

Wells completed 2
Gas 2
Gas production 15,857,000

SUMNER COUNTY

22-33-3w Rex, G. W. Long et al 2..... dry

PANHANDLE FIELDS

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Carson	3	0	0	3
Gray	2	350	0	0
Hutchinson	1	75	0	9
Moore	1	1,410	0	0
Potter	1	0	0	1
Total October	8	1,835	0	4
Total September	7	1,015	1	1
Difference	1	820	1	3

Summary of Rigs and Wells Drilling

County—	Rigs	S.D.	Drlg.	Ttl.
Carson	2	2	5	9
Gray	8	3	12	23
Hutchinson	1	3	1	5
Moore	3	0	3	6
Wheeler	0	1	0	1
Miscellaneous	1	4	2	7
Total October	15	13	23	51
Total September	17	12	15	44
Difference	2	1	8	7

WELLS COMPLETED

CARSON COUNTY

H. Chapman, Nabob Roy Co. 1..... gas
O. M. McEwen, Texoma Natural Gas Co. 1 ..... gas
J. Q. Bost-C, Canadian River Gas Co. 2 gas

Wells completed 3
Gas 3
Gas production 118,500,000

GRAY COUNTY

J. S. Morse, R. Sherwood et al 1..... 50
M. A. Shaw (Shell), Danciger O. & R. Co. 2 (second completion) 300

HUTCHINSON COUNTY
J. A. Stansbury, Stansylvania Oil Co. 2 75
MOORE COUNTY
R. O. C. Brumley, Shamrock O. & G. Co. 1 1410
POTTER COUNTY
Bivins-A, Red River Gas Co. 6 ..... gas

Gas production 13,000,000

NORTH CENTRAL TEXAS

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Archer	6	0	6	0
Brown	1	50	0	0
Callahan	2	60	1	0
Clay	1	0	1	0
Coleman	4	100	3	0
Eastland	5	44	2	1
Hardeman	1	0	1	0
Palo Pinto	3	5	0	2
Shackelford	3	12	1	1
Throckmorton	1	0	0	1
Wichita	5	60	2	0
Young	28	811	15	0
Total October	60	1,142	32	5
Total September	48	950	31	7
Difference	12	192	1	2

Summary of Rigs and Wells Drilling

County—	Rigs	S.D.	Dlg.	Ttl.
Archer	9	2	10	21
Brown	0	4	2	6
Callahan	0	1	0	1
Coleman	2	4	3	9
Cooke	1	2	2	5
Clay	0	0	1	1
Eastland	2	1	1	4
Erath	0	1	1	2
Jack	1	2	0	3
Palo Pinto	3	4	8	15
Shackelford	1	1	3	5
Stephens	1	1	1	3
Throckmorton	1	1	0	2
Wichita	7	1	5	13
Wilbarger	0	3	2	5
Young	5	3	10	18
Miscellaneous counties	2	9	4	15
Total October	35	40	53	128
Total September	26	41	53	120
Difference	9	1	0	8

WELLS COMPLETED
ARCHER COUNTY
W. M. Coleman, Trahan, Cole et al 1 ... dry
R. O. Prideaux, Bridwell Oil Co. 1 ..... dry
W. J. McMurtry, Snoddy & Somers 1 ... dry
J. W. Lester et al, Wotola Roy Co. 1 .. dry
W. O. Davis, D. L. Wolf et al 1 ..... dry
W. A. Liles, R. P. Dorian et al 1 ..... dry

Wells completed 6
Dry 6

BROWN COUNTY
E. P. and W. H. Kilgore-A, Humble O. & R. Co. 4 50
CALLAHAN COUNTY
I. N. Jackson-C, Beams et al 2 ..... dry
M. Alexander, Producing Purchasers 5 .. 60
CLAY COUNTY
F. T. Wade, Roy Ling 1 ..... dry
COLEMAN COUNTY
H. W. Kingsberry, Jamison-Pollard-Forester 3 100
T. B. DeBusk, F. Lane 1 ..... dry
J. J. Gregg, Johnson-Mattocks Oil Dev. Co. 1 ..... dry
L. L. Shield, J. C. Shaffer et al 1 ..... dry

Wells completed 4
Production 100
Dry 3
Gas production 50,000
EASTLAND COUNTY
W. A. Dalberry, Mays et al 1 ..... dry
W. H. Richardson, Prairie O. & G. Co. 1 dry
T. C. Harrell, Wilkins et al 2 ..... gas
W. H. Groves (Phillips), Lone Star Gas Co. 2 24
J. W. Carter, L. Teatsorth 4 20

Wells completed 5
Production 44
Dry 2
Gas 1
Gas production 700,000
HARDEMAN COUNTY
W. D. Berry, Chiltex Oil Co. 1 ..... dry
PALO PINTO COUNTY
Housley, Goodwin & White 1 ..... gas
Watson Bros., J. B. Gordon et al 1 ..... gas
S. B. Strawn estate, Hoffman & Page Co. 1 5

Wells completed 3
Production 5
Gas 2
Gas production 24,180,000
SHACKELFORD COUNTY
L. C. Huskey, Scott & Walker 3 ..... gas
W. C. Herrington, J. Jarvis et al 1 ..... dry
Clark, Worth Pet. Co. 3 12

Gas production 300,000
THROCKMORTON COUNTY
W. L. Everett, Sun Crest Oil Co. 1 ..... gas

Gas production 1,500,000
WICHITA COUNTY
F. Pruitt, Hamilton 1 ..... dry
W. B. Honaker, Walton & Blair 6 10
Spradling, George J. Proctor 1 ..... dry
W. B. Honaker, Schlaffke & Blair 4 ... 40
W. B. Honaker, Walton & Blair 6 10

Wells completed 5
Production 60
Dry 2
YOUNG COUNTY
Belknap Coal Co., Belknap Coal Co. 7 .. 17½
Benson, Brazelton et al 1 ..... dry
Belknap Coal Co., W. R. Fullerton 5 .... dry
G. W. Terrell estate, George Mollenkoph 1 ..... dry
S. M. J. Benson, J. J. Moran 1 ..... dry
G. M. James, Pitzer & West 1 75
E. C. Keith, F. L. Roden 1 ..... dry
Belknap Coal Co., Sheldon & Shaw 3 ... 40
Belknap Coal Co.-B, Swink & Smith 4. 150
G. W. Terrell estate-A, R. J. Watson 2 15
E. C. Keith, Wichita Prod. Co. 2 ..... dry
J. L. Jordon, Wooten & Reed 4 56
J. L. Jordon-B, Wooten & Reed 1 .... dry
Belknap Coal Co., Belknap Coal Co. 4 (second completion) 50
Belknap Coal Co., Belknap Coal Co. 8 30
Benson, W. F. Brazelton et al 1 ..... dry
Taack, W. F. Brazelton et al 7 ..... dry
J. A. Winkler, W. H. Junker 1 ..... dry
J. E. Larimore, King Royalty Co. 25 ... 64
J. E. Larimore, King Royalty Co. 27 ... 24
J. E. Larimore-B, Kleiner & Riggs 2 ... dry
T. J. Routon, George Mollenkoph 1 ..... dry
G. W. Terrell estate, George Mollenkoph 2 ..... dry
Belknap Coal Co., Sheldon & Shaw 4 ... 50
Belknap Coal Co.-B, Swink & Smith 3 90
Robinson-B, Wooten & Reed 1 ..... dry
Josh Swain, Wooten & Reed 1 ..... dry
E. C. Stovall, E. C. Stovall 14 150

Wells completed 28
Production 811
Dry 15

EAST TEXAS FIELDS

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Anderson	0	0	0	0	1	1	2
Bowie	0	0	0	0	0	4	4
Cherokee	2	0	2	0	1	2	3
Delta	1	0	1	0	0	1	1
Ellis	0	0	0	0	1	3	4
Fannin	0	0	0	0	0	2	2
Freestone	0	0	0	0	1	0	1
Gregg	241	31,493	4	0	132	212	344
Henderson	0	0	0	0	0	1	1
Hill	0	0	0	0	0	3	3
Hopkins	0	0	0	0	0	2	2
Houston	1	0	1	0	1	5	6
Lamar	0	0	0	0	2	2	4
Leon	1	0	1	0	0	3	3
Morris	0	0	0	0	1	0	1
Nacogdoches	2	0	2	0	1	9	10
Rains	0	0	0	0	0	1	1
Red River	0	0	0	0	1	4	5
Rockwall	0	0	0	0	0	1	1
Rusk	173	20,540	6	0	59	115	174
San Augustine	0	0	0	0	0	1	1
Smith	12	1,780	2	0	4	4	8
Titus	0	0	0	0	0	3	3
Tyler	0	0	0	0	0	2	2
Upshur	34	4,248	3	0	20	36	56
Van Zandt	1	108	0	0	4	7	11
Wood	1	0	1	0	3	0	3
Total	469	58,169	23	0	232	424	656

Note—Initial production represents one-hour gauge through various chokes.

WELLS COMPLETED
CHEROKEE COUNTY
W. A. Stone's No. 1 Blount Decker .... abd
Helen-Clair Oil Co.'s No. 1 M. P. Perkins ..... abd

Abandoned 2
DELTA COUNTY
Hood's No. 1 Baker ..... abd
GREGG COUNTY

	1-Hour gauge (bbls.)
Amerada Pet. Corp.'s No. 1 Killingsworth through 1-in. tubing choke (½ hr.)	95
Barnsdall and Sun Oil Co.'s No. 1 Bingham through ¾-in. tubing choke	125
Barnsdall Oil Co.'s No. 5 McGrede through ¾-in. tubing choke	85
Citizen Oil Co.'s No. 1 School Lot through open tubing (¼ hr.)	69
Cox & Hammond's No. 1 Fee (¼ hr.)	52
Continental Oil Co.'s No. 1 Flewellen	abd
Duffey Davis et al's No. 1 J. A. Godfrey (¼ hr.)	185
East Texas Ref. Co.'s No. 1 V. P. Sparks through open tubing	210
East Texas Ref. Co.'s No. 1 P. C. Castleberry through ¾-in. tubing choke	125
F.H.E. Oil Co.'s No. 1 E. M. Clemmons through 1-in. tubing choke	185
Alexandria Goldsmith's No. 1 William Kobb through open tubing	220
Gulf Prod. Co.'s No. 4 Boazman through ¾-in. tubing choke	100
Gulf Prod. Co.'s No. 3 Clemmons through ¾-in. tubing choke	97
Gulf Prod. Co.'s No. 2 Sheppard through ¾-in. tubing choke	112
A. L. Hoffman's No. 1 W. N. Kilien through ¾-in. tubing choke	125
Humble Oil & Ref. Co.'s No. 1 D. Johnson through ¾-in. tubing choke	133
Humble Oil & Ref. Co.'s No. 1 J. M. McFarland through ¾-in. tubing choke	110
A. D. King's No. 1 R. P. Doby through 10/64-in. tubing choke (24 hrs.)	185
Lester & Duffield's No. 1 J. C. McKinley through open tubing	170
Magnolia Pet. Co.'s No. 2 Jim Allen through 1-in. tubing choke	154
Magnolia Pet. Co.'s No. 5 Everett through 1-in. tubing choke	196
Magnolia Pet. Co.'s No. 1 Key through 1-in. tubing choke	150
Mook-Tex Oil Co.'s No. 2 Rodden through ¾-in. tubing choke	110
National Oil & Dev. Co.'s No. 1 A. Johnson through open tubing	105
H. L. Lockhart's No. 1 Tennery through ¾-in. tubing choke (½ hr.)	43
O. J. Perrin's No. 1 E. E. Anderson through 11/16-in. tubing choke	120
Petroleum Pipe Storage Co.'s No. 1 J. B. Tennery through 1-in. tubing choke	130
Roeser & Pendleton's No. 2-B Satterwhite through ¾-in. tubing choke	100
Root & Rhodes' No. 1 through 1-in. tubing choke	192
Selby Oil & Gas Co.'s No. 2 H. R. Snavely through open tubing	140
Shell Pet. Corp.'s No. 1 Basshorn through 11/16-in. tubing choke	125
Sinclair Oil & Gas Co.'s No. 3 Aiken through 1-in. tubing choke	135
Sinclair Oil & Gas Co.'s No. 7 Moncrief through open tubing	185
Sinclair Oil & Gas Co.'s No. 8 Moncrief through open tubing	185
Stanolind Oil & Gas Co.'s No. 2 Aikens through open tubing (⅛ hr.)	65
Sun Oil Co.'s No. 2 Satterwhite through 11/16-in. tubing choke	120
The Texas Company's No. 1 J. N. Tuttle through ¾-in. tubing choke	155
Texota Oil Co.'s No. 2 Fenn through ¾-in. tubing choke	135
Tidal Oil Co.'s No. 1 Nettleton through open tubing (½ hr.)	225
Yount Lee Oil Co.'s No. 1 Adrian & McCreary through 11/16-in. tubing choke	108
Yount Lee Oil Co.'s No. 1 L. E. Orms through 11/16-in. tubing choke	100
Delaney & Stoddard's No. 2 Dee Smith through 1-in. tubing choke	170
Gann & Weil's No. 1 G. Johnson through 1-in. tubing choke (¼ hr.)	21
Kataleen Oil Co.'s No. 1 P. Jones through ½-in. tubing choke	90
Artis Oil Co.'s No. 1 School Lot through ¾-in. tubing choke (5 hrs.)	300
Gulf Prod. Co.'s No. 2 Culver through ¾-in. tubing choke	169
Gulf Prod. Co.'s No. 3 Culver through ¾-in. tubing choke	50
Gulf Prod. Co.'s No. 8 Spear through ¾-in. tubing choke	90
Gulf Prod. Co.'s No. 5-B Watson through ¾-in. tubing choke	120
Houston Oil Co.'s No. 1 Cole through ¾-in. tubing choke	65
Humble Oil & Ref. Co.'s No. 1-B B. S. Laird through ¾-in. tubing choke	95
Humble Oil & Ref. Co.'s No. 5 D. Thomas through ¾-in. tubing choke	80
Humble Oil & Ref. Co.'s No. 6 Thomas through ¾-in. tubing choke	111
Jameson Oil Co.'s No. 1 Elder	abd
Petroleum Finance Co.'s No. 1 Laird & Crim through open tubing	220
Pilot Oil Co.'s No. 1 J. Johnson through ¾-in. tubing	185
Shell Pet. Corp.'s No. 4 J. A. Knowles through open casing and tubing	202
Shell Pet. Corp.'s No. 1 W. D. Lacy through open tubing	99
Sinclair Oil & Gas Co.'s No. 6-B A. D. King through ¾-in. tubing	185
Sun Oil Co.'s No. 7 Hilburn through ¾-in. tubing choke	88
The Texas Company's No. 2 Dixon through open tubing	185
Tidal Oil Co.'s No. 3 Barton through one 4-in. line and 2-in. tubing (2 minutes)	60
Tidal Oil Co.'s No. 3 J. S. King through open tubing (¼ hr.)	183
Tidal Oil Co.'s No. 4 J. S. King through open tubing (¼ hr.)	180
Vise et al's No. 1-B Wills through ¾-in. tubing	92
Atlantic Oil & Prod. Co.'s No. 1 Burnside through tubing	220
Atlantic Oil & Prod. Co.'s No. 2 Dumas through 11/16-in. tubing choke	150
Atlantic Oil & Prod. Co.'s No. 1-A J. Tuttle through 11/16-in. tubing choke	135
Barnsdall Oil Co.'s No. 2 George Adams through ⅝-in. tubing choke	115
Ambrose et al's No. 2 D. L. Magrill through 11/16-in. tubing choke	85
Cranfill & Reynolds' No. 1 Anderson through open tubing	220
Fain & McGaha's No. 3 Clements through 11/16-in. tubing choke	110
Green Wood & Josey's No. 1 Jon Spurrier through open tubing	211
Humble Oil & Ref. Co.'s No. 7 Edwards through ¾-in. tubing choke	85
Humble Oil & Ref. Co.'s No. 6 Holland through ¾-in. tubing choke	105
Humble Oil & Ref. Co.'s No. 5 W. R. Hughes through ¾-in. tubing choke	80
Humble Oil & Ref. Co.'s No. 5 Lawrence through ¾-in. tubing choke	60
Charles Love's No. 1 Doby	abd
Magnolia Pet.'s No. 6 Everett through ⅛-in. tubing choke	160
Magnolia Pet. Co.'s No. 2 Walker through 1-in. tubing choke	105
Margay Oil Co.'s No. 1 T. Christian through open tubing	204
Margay Oil Co.'s No. 3 Corbin through 1-in. tubing choke	125
Canadian Oil & Prod. Co.'s No. 1 J. A. Whittaker through open tubing	210
Mcmillan Pet. Co.'s No. 2 J. R. Fenton through ¾-in. tubing choke	85
O'Brian Bros. et al's No. 2 M. Haney through 11/16-in. tubing choke	110
Pilot Oil Co.'s No. 2 Fishburn through 20/64-in. tubing choke	40
Pruitt's No. 1 A. H. Phillips through open tubing	120
Republic Prod. Co.'s No. 4 Fisher through tubing	110
Roeser & Pendleton's No. 2-A Satterwhite through open tubing	189
Seigler & McCalla' No. 2 Young through open tubing	225
Lewis Sikes' No. 1 Stencil through 1-in. tubing choke	105
Stanolind and Simms Oil Co.'s No. 1 McGeorge through open tubing (½ hr.)	115
Stanolind and Simms Oil Co.'s No. 6 Persons through tubing (½ hr.)	88
Christie Stansberg et al's No. 1 J. R. Doby through ¾-in. tubing choke	135
Sun Oil Co.'s No. 1-A Tooke through 11/16-in. tubing choke	85
Superior Oil Co.'s No. 1-B Prichard through open tubing	225
The Texas Company's No. 3 Woods through 1-in. tubing choke	145
Tidal Oil Co.'s No. 2-B Nettleron Fee through tubing and casing (10 hrs.)	83
Vacuum Oil Co.'s No. 2 White through open tubing	236
Yount Lee Oil Co.'s No. 3-A Deason through 11/16-in. tubing choke	150
Yount Lee Oil Co.'s No. 3-A G. E. Fenton through 11/16-in. tubing choke	85
Yount Lee Oil Co.'s No. 1 Floyd Jones through 11/16-in. tubing choke	100
Yount Lee Oil Co.'s No. 1-B Smith through 11/16-in. tubing choke	81
Yount Lee Oil Co.'s No. 1 Tuttle through 11/16-in. tubing choke	194
Charles Davidson's No. 1 Paul Jones through ½-in. tubing choke (4 hrs.)	185
Gulf Prod. Co.'s No. 1 Clayton heirs through ¾-in. tubing choke	112
Gulf Prod. Co.'s No. 2 Goyne through ¾-in. tubing choke	134
Gulf Prod. Co.'s No. 9 Spear through ¾-in. tubing choke	139
Humble Oil & Ref. Co.'s No. 8 Knowles through ⅝-in. tubing choke	90
Ruston Drlg. Co.'s No. 1 W. A. Jones through open tubing	150
O'Brien et al's No. 1 Spear through 1-in. tubing choke	190
Oliphant et al's No. 2 Godfrey through tubing (½ hr.)	105
Oliphant's No. 3 D. M. Peterson through 1-in. tubing (½ hr.)	115
Glasscock Bros.' No. 2 Jones through ½-in. tubing choke (4 hrs.)	125
Everett et al's No. 1 J. H. Laird pinched	165
Sinclair Oil & Gas Co.'s No. 12 Cole (10 hrs.)	184
Sun Oil Co.'s No. 9 Hilburn through ¾-in. tubing choke	87
Sun Oil Co.'s No. 2 Smith through ¾-in. tubing choke	112
The Texas Company's No. 4 Elder through 1-in. tubing choke	187
Tidal Oil Co.'s No. 1 T. Bell through open tubing	150
Wycliff et al's No. 1 Smith through ¾-in. tubing choke	125
Adams & Lyles' No. 1 Taylor-Anderson through 1-in. tubing choke (¼ hr.)	165
Amerada Pet. Co.'s No. 1 J. P. Freeman through 1-in. tubing choke	120
Amerada Pet. Co.'s No. 1 McPhierson through 1-in. tubing choke (½ hr.)	86
Arkansas Fuel Oil Co.'s No. 2 Clements through tubing (½ hr.)	76
Arkansas Fuel Oil Co.'s No. 2-A Harrison through tubing (½ hr.)	71
Arkansas Fuel Oil Co.'s No. 2 Heston through tubing (½ hr.)	95
Arkansas Fuel Oil Co.'s No. 6-A Lathrop through tubing (½ hr.)	75
Arkansas Fuel Oil Co.'s No. 7-A Lathrop through tubing (½ hr.)	74
Atlantic Oil & Prod. Co.'s No. 1 J. J. Fuller through tubing	160
Atlantic Oil & Prod. Co.'s No. 2 Fuller through tubing	190
Atlantic and Sun Oil Co.'s No. 2 Hays through tubing	195
Columbia Oil & Gas Co.'s No. 1 J. G. McGrede through 1-in. tubing	112
Cranfill & Reynolds' No. 2 McGrede through tubing	300
Dillard Oil Co.'s No. 3 W. E. Jones through 1-in. tubing	160
Empire Gas & Fuel Oil Co.'s No. 2 Joe Bender through ¾-in. tubing choke	143
Empire Gas & Fuel Oil Co.'s No. 1 L. A. Jeter through tubing (45 min.)	185
Empire Gas & Fuel Oil Co.'s No. 1 Lee through tubing (½ hr.)	110
Empire Gas & Fuel Oil Co.'s No. 3 Rogers through tubing (35 min.)	135
Falvey et al's No. 2 Fee through tubing	150
Galves Oil Corp.'s No. 1 M. O. Sheppard through tubing (35 min.)	155
Gulf Prod. Co.'s No. 1 Fonville through ¾-in. tubing choke	130
Gulf Prod. Co.'s No. 3 Neely through ¾-in. tubing choke (1½ hrs.)	191
Humble Oil & Ref. Co.'s No. 4 Carter through ¾-in. tubing choke	94
Leonard Pet. Co.'s No. 4 Rose Corbin through ¾-in. tubing choke	110
Lucy Pet. Co.'s No. 1 McLee Fisher through 11/16-in. tubing choke	126
Magnolia Pet. Co.'s No. 7 Everett through 1-in. tubing choke	200
Magnolia Pet. Co.'s No. 4 Jones through 1-in. tubing choke	140
Mosely estate's No. 1 B. M. Miles pinched through tubing	75
Roeser & Pendleton's No. 3 Rodden through tubing	194
F. J. Simmon's No. 1 Jackson through various chokes	160
Stanolind Oil & Gas Co. and Simms Oil Co.'s No. 2 Fonville through open tubing (½ hr.)	160
Sun Oil Co.'s No. 4 J. W. Akin through 2-in. flow line	175
Sun Oil Co.'s No. 4 Tate through 1-in. tubing choke	120
Superior Oil Co.'s No. 1-A Prichard through various chokes	100
W. C. Turnbow's No. 1 J. C. McKinley through various chokes	110
Vacuum Oil Co.'s No. 2 Beavers through tubing	226
Virginia Oil Co.'s No. 1 J. B. Harris through ½-in. tubing choke (½ hr.)	160
Yount Lee Oil Co.'s No. 1 J. Flemster through 11/16-in. tubing choke	78
Atlantic and Byrd-Frost's No. 2 Huey through open tubing	200
Atlantic and Byrd-Frost's No. 3 Whaley through ¾-in. tubing choke	122
Golding & Murchinson's No. 4 Griffin through open tubing	200
Golding & Murchinson's No. 2 Smith through 1-in. tubing choke	185
Gulf Prod. Co.'s No. 3 M. T. Cole through open tubing	164

Gulf Prod. Co.'s No. 3 Alexander through open tubing 158
Gulf Prod. Co.'s No. 6 Ben Watson through ¾-in. tubing choke 120
Humble Oil & Ref. Co.'s No. 15-B. S. B. Laird through ¾-in. tubing choke 32
Invincible Oil Co.'s No. 1 M. J. Register through open tubing 200
Knox et al's (formerly Thompson) No. 1 Clayton heirs through open tubing 185
Magnolia Pet. Co.'s No. 4 M. A. Griffin through ¾-in. tubing choke..... 125
Magnolia Pet. Co.'s No. 4 Ben Laird through ¾-in. tubing choke (¼ hr.) 160
Prairie Oil & Gas Co.'s No. 2 Walker through ¾-in. tubing choke 106
Shell Pet. Corp.'s No. 3 Bivens through open tubing 214
Shell Pet. Corp.'s No. 3 J. B. King pinched 185
Shell Pet. Corp.'s No. 5 Knowles through open tubing 179
Shell Pet. Corp.'s No. 2 Williams through ¾-in. tubing choke 100
Sun Oil Co.'s No. 10 Hilburn through ¾-in. tubing choke 93
The Texas Company's No. 4 W. Davis through 1-in. tubing choke 162
The Texas Company's No. 5 H. T. Elder through ¾-in. tubing choke.. 107
Ray L. Martin's No. 1 Dickerson through tubing 100
Alemeda Oil Corp.'s No. 1 Doby through various chokes 150
Amerada Pet. Corp.'s No. 1 Hearne through tubing (⅓ hr.) 50
Arkansas Fuel Oil Co.'s No. 1 Adrian & McCrairy through tubing (⅓ hr.).. 124
Arkansas Fuel Oil Co.'s No. 3 Houston through tubing (⅓ hr.) 75
Arkansas Fuel Oil Co.'s No. 2-B McKinley through ¾-in. tubing choke.. 121
Arkansas Fuel Oil Co.'s No. 3-B McKinley through tubing (⅓ hr.)..... 128
Arkansas Fuel Oil Co.'s No. 1 Tinnery through open tubing (⅓ hr.) 80
Arkansas Fuel Oil Co.'s No. 1 Whittaker through tubing (⅓ hr.)..... 95
Arkansas Fuel Oil Co.'s No. 3 Whittaker through tubing (⅓ hr.)..... 165
Atlantic Oil & Prod. Co.'s No. 1 J. Wilson through 1-in. tubing 107
Barnsdall Oil Co.'s No. 1 E. L. Ferguson through ¾-in. tubing choke 100
Barnsdall Oil Co.'s No. 2 Ferguson through ¾-in. tubing choke 126
Barnsdall Oil Co.'s No. 12 McGrede through 1-in. tubing choke 135
Barnsdall Oil and Sun Oil Co.'s No. 2 Bingham through ¾-in. tubing choke 111
Bishop Oil Corp.'s No. 2 Ritchie through various chokes 125
Cal-Pet Corp.'s No. 1 O. B. Johnson through 1-in. tubing choke 125
East Texas Ref. Co.'s No. 1 G. W. Tuttle through open tubing (10 min.) 45
East Texas Ref. Co.'s No. 2 White through tubing 165
Empire Gas & Fuel Oil Co.'s No. 2 Jeter through open tubing (⅓ hr.). 124
Empire Gas & Fuel Oil Co.'s No. 1 Spurrier through open tubing (⅓ hr.) 124
Fain & McGaha's No. 5 Clements through 1-in. tubing choke 155
F.H.E. Oil Co.'s No. 2 B. C. Christian through various chokes 140
F.H.E. Oil Co.'s No. 3 Piemster through various chokes 135
M. E. Gaskill's No. 1 Sam Kay through ¾-in. tubing choke 110
Gulf Prod. Co.'s No. 2 Fonville through ¾-in. tubing choke 125
Gulf Prod. Co.'s No. 3 Lacy through ¾-in. tubing choke 125
Gulf Prod. Co.'s No. 2 Sheppard through ¾-in. tubing choke 120
Humble Oil & Ref. Co.'s No. 2-B C. B. Johnson through ¾-in. tubing choke 87
Humble Oil & Ref. Co.'s No. 1 M. Wells through ¾-in. tubing choke 93
Magnolia Pet. Co.'s No. 2 E. H. Brawley through 1-in. tubing choke 204
Magnolia Pet. Co.'s No. 3 G. Davis through 1-in. tubing choke 160
Magnolia Pet. Co.'s No. 8 Everett through 1-in. tubing choke 209
Manziell et al's No. 1 New Hope Church through ¾-in. tubing choke. 87
Margay Oil Co.'s No. 1 Joe Freeman through 1-in. tubing choke 120
O. G. Murphy et al's No. 1 J. B. Doby through various chokes 150
Owen et al's No. 2 Davis through 1-in. tubing choke (⅓ hr.) 30
Owen et al's No. 3 Davis through various chokes (⅓ hr.) 45
Roeser & Pendleton's No. 2 Sheffield through tubing 164
Skavo Oil Co.'s No. 3 C. H. Moore through tubing 195
Shell Pet. Corp.'s No. 1 T. B. Stinchomb through various chokes 115
Simms and Stanolind Oil & Gas Co.'s No. 1-B Flewellan through tubing.. 165
Stanolind Oil & Gas Co.'s No. 3 G. F. Meadows through tubing 102
Stanolind Oil & Gas Co.'s No. 1 Shoultz through tubing 163
Stanolind Oil & Gas Co.'s No. 2 Shoultz through open tubing 165
Stanolind Oil & Gas Co.'s No. 4 J. F. Wilhite through various chokes 150
Superior Oil Co.'s No. 2 Andrew Jones through tubing 165
Vacuum Oil Co.'s No. 3 Beavers through open tubing 216
Vacuum Oil Co.'s No. 3 White through open tubing 228
Wrightman's No. 1 G. E. Adams through various chokes 140
Yount Lee Oil Co.'s No. 1 Castleberry through 11/16-in. tubing choke 120
Yount Lee Oil Co.'s No. 2 Orms through 11/16-in. tubing choke 150
Continental Oil Co.'s No. 3 C. C. Crews through open tubing 156
Henry Moss' (formerly J. L. Anderson) No. 1 Knowles through open tubing 120
H. P. Key et al (formerly O. L. Rounds) through 11/64-in. tubing choke (7 hrs.) 165
Petroleum Finance Co.'s No. 1 Clayton through tubing (½ hr.) 110
Sinclair Oil & Gas Co.'s No. 1 A. A. King through 2½-in. tubing choke (¾ hr.) 165
H. R. Smith's No. 1 S. S. Ben Laird pinched 165
Sun Oil Co.'s No. 8 Hilburn through ¾-in. tubing choke 105
Tarkington & Wells' No. 1 Williams et al ..... abd
The Texas Company's No. 3 M. T. Cole through ¾-in. tubing choke 140
Tidal Oil Co.'s No. 1 S. L. Dansby through 42/64-in. tubing choke (3 hrs.) 165

Wells completed 241
Production 31,493
Abandoned 4

Note—Initial production represents 1-hour gauge through various chokes unless otherwise noted.

HOUSTON COUNTY

N. F. Irish's No. 1 B. Watson..... abd

LEON COUNTY

J. M. Ogg's No. 1 Pearlstone..... abd

NACOGDOCHES COUNTY

Sequoia Oil Co.'s No. 1 Douglas..... abd
Naco Oil Co.'s No. 1 J. C. Orton..... abd

RUSK COUNTY

	1-Hour gauge (bbls.)
Gulf Prod. Co.'s No. 2 Christian through ¾-in. tubing choke	102
Humble Oil & Ref. Co.'s No. 24 Crim through ¾-in. tubing choke	36
Humble Oil & Ref. Co.'s No. 25 Crim	abd
Humble Oil & Ref. Co.'s No. 3-A D. Ladd through ¾-in. tubing choke...	37
Magnolia Pet. Co.'s No. 8 Della Crim through ¾-in. tubing choke	37
Magnolia Pet. Co.'s No. 9 Moore through ¾-in. tubing choke (¼ hr.)	143
Magnolia Pet. Co.'s No. 4-D Wills through ¾-in. tubing choke (¼ hr.)	38
State Prod. Co.'s No. 1 Gipson through ¾-in. tubing choke	185
Wheelock & Collins' No. 2 D. Wills through ¾-in. tubing choke	95
British American's No. 3 Stone through open tubing	175
Devonian Oil Co.'s No. 2 Alford through open tubing	185
Deep Rock Oil Co.'s No. 1 C. O. Crim through open tubing	175
Earl & Martin's No. 1 Pinkston through 2½-in. tubing	170
Falcon Oil Co.'s No. 2 T. O. Wright through open tubing	150
Falcon Oil Co.'s No. 3 T. O. Wright through 5/16-in. tubing choke	65
Golding & Murchinson's No. 2 E. E. Thrash through open tubing	230
Gulf Prod. Co.'s No. 3 Cashen through ¾-in. tubing choke	93
Gulf Prod. Co.'s No. 4 Cashen through ¾-in. tubing choke	95
Gulf Prod. Co.'s No. 2-S B. Stone through open tubing	125
Humble Oil & Ref. Co.'s No. 8 Blackwell through ¾-in. tubing choke....	97
Humble Oil & Ref. Co.'s No. 1 C. A. Brightwell through ¾-in. tubing choke	117
Humble Oil & Ref. Co.'s No. 1 Lula DeGuerin through ¾-in. tubing choke	125
Humble Oil & Ref. Co.'s No. 1 J. R. Elliott through ¾-in. tubing choke	116
Humble Oil & Ref. Co.'s No. 15 Kangerga through ¾-in. tubing choke..	85
Humble Oil & Ref. Co.'s No. 2-B Kangerga through ¾-in. tubing choke..	101
Humble Oil & Ref. Co.'s No. 3 W. A. Mullikin through ¾-in. tubing choke	119
Humble Oil & Ref. Co.'s No. 1 Charles Pilgreen through ¾-in. tubing choke	111
Humble Oil & Ref. Co.'s No. 1-B J. E. Sexton through ¾-in. tubing choke..	96
Humble Oil & Ref. Co.'s No. 2 M. G. Thompson through ¾-in. tubing choke	121
Humble Oil & Ref. Co.'s No. 6 J. E. Whellis through ¾-in. tubing choke	112
H. L. Hunt's No. 1-C R. W. Fair through open tubing	146
H. L. Hunt's No. 2-C R. W. Fair through open tubing	225
H. L. Hunt's No. 2 Joe Lee through open tubing	180
H. L. Hunt's No. 2 W. P. Moore through open tubing	150
H. L. Hunt's No. 4 Thrash through open tubing	200
H. L. Hunt's No. 1 Neal Turner through open tubing	150
Kirby Pet. Co.'s No. 1-A Grambling through open tubing (⅓ hr.)	110
Magnolia Pet. Co.'s No. 5 G. W. Eaton through open casing and tubing (¼ hr.)	150
Magnolia Pet. Co.'s No. 2 Daniel Kelly through open tubing	150
Roeser & Pendleton's No. 3 M. Pool through open tubing	60
Sinclair Oil & Gas Co.'s No. 8 Kinney through open tubing	185
Sinclair Oil & Gas Co.'s No. 9 Kinney through open tubing	185
Sinclair Oil & Gas Co.'s No. 10 Kinney through open tubing	190
Stanolind Oil & Gas Co.'s No. 2 Grissom through open tubing	189
Stroube, Collins and Wheelock's No. 1 L. J. Pinkston through open tubing	135
Ward Oil Co.'s No. 4 E. S. Thrash through open tubing (⅓ hr.).....	70
Cameron Oil Co.'s No. 1 Sam P. Warren through ¾-in. tubing choke....	75
Gulf Prod. Co.'s No. 2 Terrell through open tubing	80
Humble Oil & Ref. Co.'s No. 48 L. D. Crim through ¾-in. tubing choke..	101
Humble Oil & Ref. Co.'s No. 49 Crim through ¾-in. tubing choke	127
Humble Oil & Ref. Co.'s No. 4 R. H. and W. L. Laird through ¾-in. tubing choke	114
Humble Oil & Ref. Co.'s No. 3-A B. F. Laird through ¾-in. tubing choke..	101
Humble Oil & Ref. Co.'s No. 3 Minor through ¾-in. tubing choke	103
Humble Oil & Ref. Co.'s No. 11 Peterson through ¾-in. tubing choke.....	111
Humble Oil & Ref. Co.'s No. 12 Peterson through ¾-in. tubing choke (3 hrs.)	202
Humble Oil & Ref. Co.'s No. 2 J. Wooly through ¾-in. tubing choke..	81
Leonard Pet. Co.'s No. 1 Delia Gill through 11/16-in. tubing choke	60
Magnolia Pet. Co.'s No. 1 Nat Bean through ¾-in. tubing choke (¼ hr.)	90
Magnolia Pet. Co.'s No. 1 Jernigan through ¾-in. tubing choke (¼ hr.)	159
Manahan Drlg. Co.'s No. 2 Jernigan through tubing	235
Navarro Oil Co.'s No. 3 J. N. Peterson through 1¼-in. tubing choke	125
Pilkin & Goldstein's No. 1 V. Barton through tubing	120
Snowden & McSweeney's No. 6 R. H. Laird (½ hr.)	85
Stanolind Oil & Gas Co.'s No. 2 W. H. Smith through open tubing	179
Stroube et al's No. 1 V. Barton through open tubing	180
Westheimer & Stroube's No. 2 Brightwell through ¾-in. tubing choke....	95
Texas State Oil Co.'s No. 1 Dan Kelly through ¾-in. tubing choke (½ hr.)	52
Golding & Murchinson's No. 2 Thrash through open tubing	155
Gordon et al's No. 1 Thompson through open casing (¼ hr.)	150
Goue & Murray's No. 1 Mrs. Minnie Priddy through ¾-in. tubing choke (6 hrs.)	105
Humble Oil & Ref. Co.'s No. 1 J. D. Florey through ¾-in. tubing choke	135
Humble Oil & Ref. Co.'s No. 3 James Fuller through 11/16-in. tubing choke	127
Humble Oil & Ref. Co.'s No. 5 P. R. Guerin through ¾-in. tubing choke..	114
Humble Oil & Ref. Co.'s No. 4-A Ida Holt through ¾-in. tubing choke...	114
Humble Oil & Ref. Co.'s No. 4 Kangerga through ¾-in. tubing choke.	72
Humble Oil & Ref. Co.'s No. 3 H. A. Piercy through ¾-in. tubing choke..	112
Humble Oil & Ref. Co.'s No. 10 Plowman through ¾-in. tubing choke...	98
Humble Oil & Ref. Co.'s No. 3 W. P. Price through 11/16-in. tubing choke	106
Humble Oil & Ref. Co.'s No. 1 Aggie Scott through ¾-in. tubing choke...	35
Humble Oil & Ref. Co.'s No. 5 J. E. Wheelis through ¾-in. tubing choke	88
Humble Oil & Ref. Co.'s No. 7 Wheelis through ¼-in. tubing choke	99
H. L. Hunt's No. 2 Russell through open tubing	225
Indian Synd.'s No. 1 Deason through open tubing (12 hrs.)	250
Lion Oil & Ref. Co.'s No. 2 W. P. Smith through tubing	25
Shell Pet. Corp.'s No. 1 W. P. Neal through open tubing	85
Sinclair Oil & Gas Co.'s No. 3-B Mayfield through open tubing	170
Sun Oil Co.'s No. 2 Barksdale through ¾-in. tubing	85
Sun Oil Co.'s No. 3 Horach Schuler through open tubing	178
The Texas Company's No. 1 First Guaranty Bank through ¾-in. tubing choke	65
The Texas Company's No. 1 Cora Hannah through open tubing	110
The Texas Company's No. 4 J. D. Stone through 1-in. tubing	75
Stevens et al's No. 1 Dr. Pickett.....	abd
Abercrombie & Harrison pinched.....	165
Dink Oil Co.'s (formerly California Movie Stars) No. 1 Givens through open tubing	225
Tip DeArman's No. 1 King pinched...	185
Devonian Oil Co.'s No. 6 R. A. Motley through ¾-in. tubing choke	110
East Texas Ref. Co.'s No. 1 Moses Mayfield	185
Gulf Prod. Co.'s No. 5 Brightwell through tubing	150
Gulf Prod. Co.'s No. 1-B C. E. Christian through ¾-in. tubing choke....	70
Gulf Prod. Co.'s No. 3 Laird through ¾-in. tubing choke	82
Gulf Prod. Co.'s No. 1 Morris through ¾-in. tubing choke	82
Humble Oil & Ref. Co.'s No. 37 L. D. Crim through ¾-in. tubing choke..	69
Humble Oil & Ref. Co.'s No. 14 Peterson through ¾-in. tubing choke....	80
Humble Oil & Ref. Co.'s No. 3-A H. Sexton through ¾-in. tubing choke	108
Magnolia Pet. Co.'s No. 1 Mrs. A. A. Johnson through 4-in. tubing choke	121
Magnolia Pet. Co.'s No. 5 Dick Wells pumping (6 hrs.)	185
D. G. Oliphant Co.'s No. 1 Powers through open casing	12
Patterson Drlg. Co.'s No. 1 Brock through 1-in. tubing (¼ hr.).....	37
Shell Pet. Corp.'s No. 3 J. Spivey through open tubing	214
British-American's No. 4 J. S. Stone through open tubing	175
Depoli's No. 1-B M. M. Barksdale through open tubing	200
East Texas Ref. Co.'s No. 2 M. O. O'Quinn through open tubing	175
Golding & Murchinson's No. 3 Blackwell through open tubing	160
Houseman & Walter's No. 1 Alford through ½-in. tubing choke	125
Gulf Prod. Co.'s No. 6 Murphy through ¾-in. tubing choke	90
Gulf Prod. Co.'s No. 2 Stone through ¾-in. tubing choke	85
Haynes Bros.' No. 2 Thrash through open tubing	175
John Hoosier's No. 1 L. J. Jones through 1-in. tubing choke (½ hr.)	60
Humble Oil & Ref. Co.'s No. 9 Blackwell through ¾-in. tubing choke....	92
Humble Oil & Ref. Co.'s No. 2 C. A. Brightwell through ¾-in. tubing choke	61
Humble Oil & Ref. Co.'s No. 5-A Ida Holt through ¾-in. tubing choke...	104
Humble Oil & Ref. Co.'s No. 5 Milliken through ¾-in. tubing choke.. ..	80
Humble Oil & Ref. Co.'s No. 4 J. W. Turner through ¾-in. tubing choke	30
Humble Oil & Ref. Co.'s No. 5 J. W. Turner through ¾-in. tubing choke	80
Humble Oil & Ref. Co.'s No. 2 T. M. Wooley through ¾-in. tubing choke	150
T. A. Johnson's No. 1 through open tubing	200
Russell & Terrell's No. 1 Deason through open tubing	100
Mid-Kansas Oil & Gas Co.'s No. 1 Cora L. Graves through open tubing (½ hr.)	72
Mid-Kansas Oil & Gas Co.'s No. 2 R. G. Mason through 1-in. tubing choke	110
Mid-Kansas Oil & Gas Co.'s No. 3 E. E. Moore through open tubing	110
Owenwood Oil Co.'s No. 3 W. Wills through open tubing	163
R.M.V. Oil Co.'s No. 4 Bridwell..	185
W. H. Rowe's No. 1 Deason through open tubing	106
Stanolind Oil & Gas Co.'s No. 1-A Horace Schuler through open tubing..	116
Car G. Willie's (formerly White & Wiley) No. 1 Joe Lee through open tubing	200
Campbell Oil Co.'s No. 1 Compton...	abd
Empire Gas & Fuel Co.'s No. 1 C. O. Christian through open tubing	23
Empire Gas & Fuel Co.'s No. 2 C. O. Christian through open tubing.....	160
Humble Oil & Ref. Co.'s No. 2-B Sexton through ¾-in. tubing choke..	76
McMahon & McCullough through tubing (½ hr.)	87
Tidal Oil Co.'s No. 5 Nat Bean through tubing (¼ hr.)	115
Wheelock & Collins' No. 2 Dick Wells pinched	165
Acme Oil Co.'s No. 1 M. T. Thompson through open tubing	125
T. C. Adams' No. 2 Arnold through open tubing	100
Arkansas Fuel Oil Co.'s No. 2 Ferguson through open tubing	160
Arkansas Fuel Oil Co.'s No. 2 R. W. Wheelis through open tubing	75
Blackwell Oil & Gas Co.'s No. 3 Moore through open tubing	150
British - American's No. 2 Cooper through open tubing	152
British-American's No. 1-B Kangerga through open tubing	165
Jim Cloud and Murchinson's No. 4 Blackwell through open tubing.. ..	150
Grayburg Oil Co.'s No. 1 Kangerga through 1-in. tubing choke	105
Gulf Prod. Co.'s No. 1-C Mayfield through ¾-in. tubing choke	130
Gulf Prod. Co.'s No. 2 L. P. Thraw through ¾-in. tubing choke	90
Humble Oil & Ref. Co.'s No. 10 Blackwell temporarily	abd
Humble Oil & Ref. Co.'s No. 2 J. D. Florey through ¾-in. tubing choke..	86
Humble Oil & Ref. Co.'s No. 4 J. E. Glover through ¾-in. tubing choke..	99
Humble Oil & Ref. Co.'s No. 1 J. J. Pitner through ¾-in. tubing choke	116
Humble Oil & Ref. Co.'s No. 11 Plowman through ¾-in. tubing choke....	75
Humble Oil & Ref. Co.'s No. 17 Plowman	abd
Humble Oil & Ref. Co.'s No. 3 Thompson through ¾-in. tubing choke.....	120
H. L. Hunt's No. 6 Calvin Young through open tubing	155
E. W. Jones' No. 2 W. P. Moore through open tubing	150
Mid-Kansas Oil & Gas Co.'s No. 1 Kangerga through open tubing	147
Mid-Kansas Oil & Gas Co.'s No. 1 Wills Rollins through 2½-in. tubing.....	230
Mid-Kansas Oil & Gas Co.'s No. 2 M. L. Thompson through 2½-in. tubing	195
Navarro Oil Co.'s No. 6 Young through 1½-in. tubing choke	130
Rubin & Weisman's No. 1-A Keeling through open tubing	156
Sinclair Oil & Gas Co.'s No. 6 F. B. Wilson through open tubing	165
Sombar Oil Co.'s No. 1 A. P. Finney through ¾-in. tubing choke	100
Stanolind Oil & Gas Co.'s No. 2-B Horace Schuler through open tubing	57
Sun Oil Co.'s No. 4 O. W. Knight through open tubing (10 min.).....	15
The Texas Company's No. 1 J. W. Turner through 1-in. tubing choke..	60
Vitek Interest's No. 1 Mrs. J. R. Irion	abd
Woodley Pet. Corp.'s No. 1 McMillan through 2½-in. tubing choke	120

Wells completed 173
Production 20,540
Abandoned 6

SMITH COUNTY

	1-Hour gauge (bbls.)
Gulf Prod. Co.'s No. 2 Jack Wiley through ¾-in. tubing choke	110
Jerome McLester's No. 1 S. S. Cooke through ¼-in. tubing choke	30
Sinclair Oil & Gas Co.'s No. 2 C. Patterson through open tubing	126
Sun Oil Co.'s No. 2 Henson through open tubing	159
Ben Banner's No. 1 Lee White	abd
Graham Bros.' No. 1 T. O. Wright through ¾-in. tubing choke	80
C. Edman Perry's (formerly Adams et al) No. 1 T. O. Wright through tubing (24 hrs.)	185
Arcadia Ref. Co.'s No. 1 J. H. Green through open tubing	175

Magnolia Pet. Co.'s No. 10 J. R. Wright through open casing and tubing..... 555
Sinclair Oil & Gas Co.'s No. 3 Dora Wright through open tubing 180
Simms Oil Co.'s No. 3 J. D. Henson through open tubing 180
Humble Oil & Ref. Co.'s No. 3 M. C. Thompson ..... abd

Wells completed 12
Production 1,780
Abandoned 2

UPSHUR COUNTY

	1-Hour gauge (bbls.)
Alma Pet. Corp.'s No. 1 C. D. Gay through ¾-in. tubing choke	185
Alma Pet. Corp.'s No. 2 Y. W. L. Young through ¾-in. tubing choke	180
Gibson Oil Co.'s No. 1 W. F. Smith through 1-in. tubing choke	120
Magnolia Pet. Co.'s No. 2 Adkins through 1-in. tubing	105
Chatham Oil Co.'s No. 1 M. Fenton through tubing	100
Conservative Oil Co.'s No. 4 Victory through 1-in. tubing	110
East Texas Ref. Co.'s No. 1 Mary Rodden through 1-in. tubing choke.....	150
Home Oil Co.'s No. 1 F. D. Futrell....	abd
Humble Oil & Ref. Co.'s No. 2 G. W. Johnson through ¾-in. tubing choke	104
Humble Oil & Ref. Co.'s No. 1 H. M. Reeves through ¾-in. tubing choke	85
A. D. King's No. 1 Lloyd through 11/16-in. tubing choke	105
Margay Oil Co.'s No. 2 Victory through open tubing	153
Pace & Mitchin's No. 1 A. D. Adkins through ¾-in. tubing choke	125
W. H. Peckham's No. 1 T. Wells through ¾-in. tubing choke	130
Shell Pet. Corp.'s No. 2 C. C. Landers through open tubing	135
Cranfill & Reynolds' No. 3 Porter through open tubing	37
Humble Oil & Ref. Co.'s No. 1 G. W. Johnson through ¾-in. tubing choke	70
Humble Oil & Ref. Co.'s No. 3 G. W. Johnson	85
Humble Oil & Ref. Co.'s No. 1 J. T. Miller through ¾-in. tubing choke..	28
Humble Oil & Ref. Co.'s No. 1-C Eva O'Byrne through ¾-in. tubing choke	22
Magnolia Pet. Co.'s No. 1 N. W. Blackwell through 1-in. tubing	160
Shell Pet. Corp.'s No. 4 C. C. Landers through various chokes	120
Sun Oil Co.'s No. 1 D. J. Watkins.....	abd
Sun Oil Co.'s No. 2 Watkins through tubing (12 hrs.)	85
Harry Wilson's No. 1 J. C. Wileford..	abd
Alma Pet. Co.'s No. 1 J. B. Watson through open tubing	120
Cal-Pet Corp.'s No. 2 Dearing through 1-in. tubing choke	70
Cal-Pet Corp.'s No. 1 Walker through 1-in. tubing	75
Deaner & Bierson's No. 1 Victory through ¾-in. tubing choke (¼ hr.)	37
Granite Oil Trust Co.'s No. 1 Victory (formerly M. E. Bogle) through various chokes	100
Humble Oil & Ref. Co.'s No. 5 D. W. Holland through ¾-in. tubing choke	85
Magnolia Pet. Co.'s No. 3 Adkins through 1-in. tubing	100
Mudge Oil Co.'s No. 3 Free through tubing	190
Osteen et al's No. 1 O. F. Smith through open tubing (¼ hr.).....	77

Wells completed 34
Production 4,248
Abandoned 3

WOOD COUNTY

Wood County Dev. Co.'s No. 1 Rick.. abd

VAN ZANDT COUNTY

Pure Oil Co.'s No. 4 W. H. York..... 108

Note—Unless otherwise noted, all initial production records in the East Texas report represent one hour's gauge.

WEST TEXAS FIELDS

Summary of Wells Completed

County—	Comp.	Prod.	Dry	Gas
Howard	1	918	0	0
Irion	1	0	1	0
Jones	1	40	0	0
Loving	2	96	0	0
Pecos	1	0	1	0
Upton	2	154	1	0
Ward	4	912	0	0
Total October	12	2,120	3	0
Total September	7	708	2	0
Difference	5	1,412	1	0

Summary of Rigs and Wells Drilling

County—	Rigs	S.D.	Dig.	Ttl.
Crane	0	0	1	1
Ector	0	1	1	2
Fisher	2	0	3	5
Howard	0	0	3	3
Irion	0	3	2	5
Jones	1	0	1	2
Loving	3	5	2	10
Pecos	2	0	1	3
Reagan	0	1	3	4
Upton	1	1	2	4
Ward	3	14	7	24
Winkler	1	0	0	1
Miscellaneous counties ..	1	17	4	22
Total October	14	42	30	86
Total September	11	47	22	81
Difference	3	5	7	5

WELLS COMPLETED
HOWARD COUNTY

W. R. Settles, Cardinal Oil Co. 1 (second completion) 918

IRION COUNTY

Harlan Horney, Perry Fox 2..... dry

JONES COUNTY

O. N. Brewer, Tex-Mex Oil Co. and Eastland Oil Co. 1 40

LOVING COUNTY

W. D. Johnson, Eppenauer & Lockhart 1 91
L. D. Cartwright et al, Lewis & Slagel Drlg. Co. 1 5

PECOS COUNTY

I. G. Yates (Sun et al), Fred Slaughter et al 1 ..... dry
John F. Lane, Cosby Producing & Royalty Co. et al 1 154
Union Land Co., Porter, Rankin et al 1 dry

WARD COUNTY

G. W. O'Brien et al, Gulf. Prod. Co. 18 630
Hall & Roberts et al, Buster Black 1.. 126
George Merritt, Peck-Fuglarr et al 1... 6
R. H. Gill, Buck Sturm and Simms Pet. Co. 1 150

Wells completed 4
Production 912

SOUTHWEST TEXAS FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Bruner	0	0	0	0	0	1	1
Cooksey	1	0	1	0	0	0	0
Darst Creek ..	1	912	0	0	0	2	2
Dobrowolski ..	1	10	0	0	0	1	1
Chittim	0	0	0	0	0	1	1
Cartwright	0	0	0	0	0	1	1
McFaddin	0	0	0	0	0	2	2
Mirando	12	3,872	3	1	0	6	6
Pettus	0	0	0	0	0	4	4
Saxet	0	0	0	0	0	1	1
Slick	0	0	0	0	0	1	1
Welder	1	0	0	1	0	1	1
Miscellaneous	13	5	12	0	10	85	95
Total Oct....	29	4,799	16	2	10	106	116
Total Sept...	32	8,638	24	1	10	87	97
Difference ..	3	3,839	8	1	0	19	19

WELLS COMPLETED
COOKSEY POOL—BEXAR COUNTY

Anoil, Witherspoon Oil Co. 1..... abd
DOBBOWOLSKI POOL—BEXAR COUNTY
Ida A. Beck, Gatlin Oil Co. 8..... 10
COLE POOL—DUVAL COUNTY
Benavides, Cole Petroleum Co. 70..... 100
SCHOOLFIELD-O'BYRNE POOL—DUVAL COUNTY
Bishop Duval Land Co., Duval Oil Corp. 4 1500
Bishop Duval Land Co., Duval Oil Corp. 5 500
P. E. White, Humble Oil & Ref. Co. 1.. 412
Wilson, Magnolia Pet. Co. 4..... 500
Bishop Cattle Co., Thomas & Tarver, Inc., 3 800
DARST CREEK—GUADALUPE COUNTY
Sue Denman, Humble Oil & Ref. Co. 1-C 912
WELDER POOL—SAN PATRICIO COUNTY
Welder, Welder Oil Corp. 2..... gas
COLE POOL—WEBB COUNTY
A. Benavides, Magnolia Pet. Co. 5..... 35
Bruni, O. W. Killam 20..... gas
CAROLINA-TEXAS POOL—WEBB COUNTY
Benavides, George S. Marshall 1..... abd
ESCOBAS-MUCKELROY POOL—ZAPATA COUNTY
Trevino, Trevino Oil Corp. 11-A..... 25
CUELLAR POOL—ZAPATA COUNTY
Cuellar, O. W. Killam 28-A..... abd
Cuellar, O. W. Killam 29-A..... abd
MISCELLANEOUS WILDCATS
Atascosa County—
Trueblood, Tom Draper 1..... abd
Bexar County—
Ellison, Moore-Jauer 1..... abd
Duval County—
Hubbard, Camp and Southern Crude 2 abd
Sutherland, L. E. Lockhart 1..... abd
Guadalupe County—
J. E. Linne, Linne et al 1..... abd
Kerr County—
Jeff Love, Evans & Gant 1..... abd
Medina County—
R. J. Taylor, Medina O. & R. Co. 2.... 5
San Patricio County—
Baldwin, Jacob, Buzzini & Pickett 2.. abd
Webb County—
Bruni, O. W. Killam 2..... abd
Billings, Eugene Garner, Jr. 1..... abd
Williamson County—
A. Forewood, Citizens Oil Dev. Co. 2.... abd
Zapata County—
Henne-Winch, F. H. Etheridge 1..... abd
Gutierrez, H. L. Sargent 1..... abd

Completed 29
Production 4,799
Gas 2
Dry 16

ARKANSAS FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Chicot	0	0	0	0	0	1	1
Clay	0	0	0	0	0	1	1
Cleburne	0	0	0	0	0	1	1
Cleveland	0	0	0	0	1	0	1
Columbia	0	0	0	0	0	1	1
Crawford	0	0	0	0	0	1	1
Dallas	0	0	0	0	0	3	3
Hot Springs ..	0	0	0	0	0	1	1
Lawrence	0	0	0	0	1	0	1
Lincoln	0	0	0	0	0	1	1
Little River ..	0	0	0	0	2	0	2
Logan	0	0	0	0	0	1	1
Miller	0	0	0	0	0	1	1
Ouachita	0	0	0	0	0	3	3
Pike	0	0	0	0	0	2	2
Prairie	0	0	0	0	1	0	1
Scott	0	0	0	0	0	1	1
Sevier	0	0	0	0	1	0	1
Union	2	1,450	0	0	2	7	9
Van Buren	0	0	0	0	0	1	1
Washington ..	0	0	0	0	0	1	1
Yell	0	0	0	0	0	1	1
Total Oct....	2	1,450	0	0	8	28	36
Total Sept...	3	0	3	0	7	27	34
Difference ..	1	1,450	3	0	1	1	2

WELLS COMPLETED
UNION COUNTY

3-18-13 Hadley, Wilson & Chapman 1 50
3-18-13 H. Norman, Wilson & Chapman 1 1400

Wells completed 2
Production 1450

GULF COAST FIELDS

TEXAS
Summary of Field Operations

Field—	Comp.	Prod.	Abd	Gas	Rig	Dig.	Ttl.
Barbers Hill .	6	4,890	0	0	1	3	4
Batson	1	15	0	0	0	0	0
Damon Mound	0	0	0	0	0	1	1
High Island ..	0	0	0	0	0	2	2
Hull	0	0	0	0	0	3	3
Humble	1	115	0	0	0	3	3
Lockwood	2	790	0	0	0	2	2
Lost Lake	0	0	0	0	0	1	1
Mykawa	0	0	0	0	0	1	1
Moss Bluff	1	0	1	0	0	4	4
Nash	0	0	0	0	0	1	1
Orchard	0	0	0	0	0	1	1
Pierce Junction	0	0	0	0	0	2	2
Port Neches ..	0	0	0	0	0	1	1
Raccoon Bend.	1	0	1	0	0	0	0
Refugio	3	1,089	1	0	1	3	4
Miscellaneous .	3	600	1	1	7	28	35
Total Oct....	18	7,499	4	1	9	66	75
Total Sept...	20	4,396	11	2	5	62	67
Difference ..	2	3,103	7	1	4	4	8

SOUTH LOUISIANA
Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Bayou Blue ..	0	0	0	0	0	1	1
Hackberry ...	4	6,514	0	0	1	2	3
Jennings	0	0	0	0	0	2	2
Lake Barre ..	1	1,870	0	0	0	1	1
Lake Pelto ..	1	0	1	0	0	0	0
Lockport	1	1,000	0	0	1	0	1
Sorrento	0	0	0	0	0	1	1
Starks	1	25	0	0	0	0	0
Sweet Lake ..	0	0	0	0	0	1	1
Vinton	0	0	0	0	0	1	1
Miscellaneous .	7	2,575	4	0	1	8	9
Total Oct...	15	11,984	5	0	3	17	20
Total Sept..	7	4,000	6	0	3	17	20
Difference .	8	7,984	1	0	0	0	0
Ttl. G. Coast	33	19,483	9	1	12	83	95
Total Sept..	27	8,396	17	2	8	79	87
Difference .	6	11,087	8	1	4	4	8

WELLS COMPLETED
BARBERS HILL—CHAMBERS COUNTY

Wilburn, Gulf Prod. Co. 5.....1680
Ebanspacker, Nat Hunter Producing Co. (Humphreys Corp.) 1 1550
E. H. Winfree, Nat Hunter Producing Co. (Humphreys) 6 110
Wilburn, McAlbert Oil Co. 4.....1440
Woodward, McAlbert Oil Co. 1..... 50
Fisher, Rio Bravo Oil Co. 2..... 60

Wells completed 6
Production 4890
BATSON—HARDIN COUNTY
Union Pet. Co., Acorn Oil Co. 4..... 15
HUMBLE—HARRIS COUNTY
Koehler, The Texas Company 24..... 115
LOCKWOOD—FORT BEND COUNTY
George, Cullen & West 2..... 600
Lockwood & Sharp, Cullen & West 2-A 190

Wells completed 2
Production 790
MOSS BLUFF—LIBERTY COUNTY
Carter, Texas Gulf Sulphur Co. 4..... abd
RACCOON BEND—AUSTIN COUNTY
Martha Remmert, Humble Oil & Ref. Co. 1 ..... abd
REFUGIO—REFUGIO COUNTY
O'Connor, Moody-Seagraves Prod. Co. 4 65
Rogers, L. L. Smith 1 ..... abd
M. F. Lambert, United Prod. Corp. 4..1024

Wells completed 3
Production 1089
Abandoned 1

MISCELLANEOUS TEXAS
Brazoria County—
Manvel-Belcher, The Texas Company 1 600
Victoria County—
Travieso Sur., McFaddin, United Prod. Corp. 5-A ..... gas
Wharton County—
S.A.M.C. Sur. 13, Hahn, Bonds & Alexander 1 ..... abd

Wells completed 3
Production 600
Abandoned 1
Gas 1

LOUISIANA
HACKBERRY—CAMERON PARISH

Landry, Calcasieu Oil Co. 3..... 14
Watkins, Calcasieu Oil Co. 26..... 3000
Irwin, J. G. Sutton 2..... 3000
State, Yount Lee Oil Co. 43..... 500

Wells completed 4
Production 6514
LAKE BARRE—TERREBONNE PARISH
State, The Texas Company 13.....1870
LAKE PELTO—TERREBONNE PARISH
State, The Texas Company 6..... abd
LOCKPORT—CALCASIEU PARISH
Farquahar, Vacuum Oil Co. 5-A.....1000
STARKS—CALCASIEU PARISH
Lutcher-Moore, Gulf Ref. Co. 28..... 25

MISCELLANEOUS LOUISIANA
Calcasieu Parish—
Iowa—Walt, Vacuum Oil Co. 1.....1500
Cameron Parish—
Cameron Meadows—Cameron Meadows Vacuum Oil Co. 2 1000
Iberville Parish—
Bayou Choctaw—Myrtle Grove, Standard Oil Co. 1 75
Iberia Parish—
Jeff. Island—Lake Peigneur, Jeff. Lake Oil Co. 24 ..... abd
LaFourche Parish—
Chacahoula—Stark, State Prod. Co. 1-A abd
Stark, State Prod. Co. 1-B..... abd
Vernon Parish—
White Grandin Lbr. Co., Exchange Oil Co. 1 ..... abd

Wells completed 7
Production 2575
Abandoned 4

NORTH LOUISIANA

Summary of Field Operations

	Comp.	Prod.	Dry	*Gas	Rig	Dig.	Ttl.
Bienville	0	0	0	0	0	1	1
Bossier	1	0	1	0	0	3	3
Caddo	2	0	2	0	0	3	3
Caldwell	0	0	0	0	0	2	2
Catahoula	0	0	0	0	0	1	1
Claiborne	1	0	0	1	0	0	0
DeSoto	1	0	1	0	0	5	5
LaSalle	0	0	0	0	0	1	1
Morehouse	0	0	0	0	1	0	1
Natchitoches .	0	0	0	0	0	3	3
Ouachita	0	0	0	0	2	0	2
Red River	0	0	0	0	0	2	2
Richland	4	0	1	3	4	7	11
Sabine	10	1,117	2	0	3	22	25
Tensas	0	0	0	0	0	2	2
Union	1	0	1	0	0	3	3
Vernon	1	0	1	0	0	3	3
Total Oct....	21	1,117	9	4	10	58	68
Total Sept...	13	0	8	5	16	55	71
Difference ..	8	1,117	1	1	6	3	3

*Gas production — Claiborne, 29,279,000 feet; Richland, 86,746,000 feet; total, 116,025,000 feet.

WELLS COMPLETED
BOSSIER PARISH

10-19-13 Allison, Rombaugh et al 1.. dry
CADDO PARISH
27-21-15 Christian, J. T. McCormick 1 dry
15-17-14 Cunningham-O'Connor, W. P. Wallace, trustee, 1 ..... dry
CLAIBORNE PARISH
16-19- 5 Treadwell & Hawk, United Gas Public Service Co. 1..... gas

Gas production.....29,279,000
DESOTO PARISH
5-12-14 Wagner, S. S. Meek, trustee, 1 dry
RICHLAND PARISH
24-17- 5 Noe, Southern Carbon Co. 1.. dry
24-17- 5 Cumminga, United Gas Public Service Co. 2 ..... gas
32-17- 6 Louisiana-State, United Gas Public Service Co. 1-B..... gas
35-17- 6 Pipes, United Gas Public Service Co. 1 ..... gas

Wells completed 4
Dry 1
Gas 3
Gas production 86,746,000
SABINE PARISH
1- 7-13 Hale, W. M. Coates 2 50
1- 7-12 Sabine Lumber Co., W. M. Coates 1-B 250
1- 7-13 Towery, W. M. Coates 1..... 200
12- 7-11 Byrd, Crescent Drlg. Co. 1.. 500
1- 7-11 Moran, Hawkins et al 1..... 25
17- 9-11 Stephens, Langbridge Oil Co. 1 40
35- 8-12 Barthold, Lanier & Dier 1... 10
16- 7-12 Bowman-Hicks, Loring Oil Co. 19 ..... dry
10- 7-11 La. Long Leaf Lumber Co., Pelican Natural Gas Co. 10 42
2- 7-12 Bowman-Hicks, H. W. Perritt 5 ..... dry

Wells completed 10
Dry 2
Production 1117
UNION PARISH
9-22-2w Douglas, Dan Brooks 1..... dry
VERNON PARISH
29- 3- 7 White & Grandin, Exchange Pet. Co. 1 ..... dry

MISSISSIPPI

Summary of Field Operations

	Comp.	Prod.	Dry	*Gas	Rig	Dig.	Ttl.
Adams	1	0	1	0	0	0	0
Clarke	0	0	0	0	0	1	1
Hinds	3	0	2	1	5	2	7
Humphrey	0	0	0	0	0	1	1
Jasper	0	0	0	0	0	1	1
Lowndes	0	0	0	0	1	0	1
Monroe	0	0	0	0	0	2	2
Newton	0	0	0	0	0	1	1
Noxubee	0	0	0	0	0	1	1
Rankin	4	0	0	4	3	6	9
Scott	0	0	0	0	1	0	1
Warren	0	0	0	0	0	2	2
Webster	0	0	0	0	0	1	1
Winston	0	0	0	0	0	1	1
Total Oct....	8	0	3	5	10	19	29
Total Sept...	1	0	0	1	11	20	31
Difference ..	7	0	3	4	1	1	2

*Gas production—Hinds County, 25,000,000 feet; Rankin County, 109,708,000 feet; total, 134,708,000 feet.

WELLS COMPLETED
ADAMS COUNTY

61-18-1w Brandan Hall farm, Ark.-La. Pipe Line Co. 1..... dry

HINDS COUNTY

4-5n-1e Miss. Co., Hilgard Gas Co. 1 dry
2-5n-1e Mayer, Jackson O. & G. Corp. 3 dry
15-5n-1e Federal Compress & Warehouse Co., Love Pet. Co. 1 gas

Wells completed 3
Dry 2
Gas 1
Gas production 25,000,000

RANKIN COUNTY

13-5n-1e Wright Cast Stone Co., James Alexander 1 gas
11-5n-1e Buford, J. E. Grandstaff et al 1 gas
12-5n-1e Allen, Meredith et al 1 gas
12-5n-1e Appelwhite & Holden, Willis & Culley 1 gas

Wells completed 4
Gas 6
Gas production 109,708,000

EAST TEXAS GAS FIELD

(Border counties)

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Bowie	0	0	0	0	4	4	
Camp	0	0	0	0	0	1	1
Cass	1	0	1	0	5	3	8
Harrison	3	0	3	0	2	1	3
Marion	0	0	0	0	0	2	2
Panola	1	0	1	0	3	6	9
Red River	0	0	0	0	0	2	2
Shelby	3	0	3	0	0	11	11
Total Oct.	8	0	8	0	5	35	40
Total Sept.	3	0	3	0	9	41	50
Difference	5	0	5	0	4	6	10

WELLS COMPLETED

(Border counties)

WELLS COMPLETED

CASS COUNTY

John C. Byers Sur., Atheny, Olds & Smith 1 dry

HARRISON COUNTY

Thomas Toby Sur., Bivens Farm Co., Gholson et al 1 dry
W. H. Payne Sur., Taylor, O. H. Parkering 1 dry
Thomas Iden Sur., Watson, Thomas & Kinsey 1 dry

PANOLA COUNTY

C. T. Anderson Sur., Vinson, Southwest Oil & Gas Co. 1 dry

SHELBY COUNTY

G. W. Mitchell Sur., Ashberry, Bradley & Kadane 1 dry
Jonas Harrison Sur., Pickering Lbr. Co., H. P. Glidden 1 dry
Alfred Lindsey Sur., Bush, T. A. Martin 1 (location) abd
W. J. Timms Sur., Powers, George L. Pace 1 (location) abd
J. Clay Sur., Hughes, Schultz et al 1 dry

KENTUCKY FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Warren	0	0	0	0	0	1	1
Ohio	3	60	1	0	2	23	25
Daviess	4	143	1	0	0	17	17
Hancock	2	0	0	2	0	8	8
McLean	1	100	0	0	7	2	9
Hart	4	170	0	0	0	10	10
Greene	0	0	0	0	1	1	2
Muhlenberg	3	0	0	3	0	2	5
Edmonson	0	0	0	0	0	1	1
Todd	0	0	0	0	0	1	1
Nelson	0	0	0	0	0	1	1
Hopkins	0	0	0	0	0	2	2
Taylor	0	0	0	0	0	1	1
Carroll	0	0	0	0	0	1	1
Webster	2	0	0	2	0	0	2
Cumberland	0	0	0	0	0	1	1
Madison	0	0	0	0	0	1	1
Henderson	2	45	0	0	0	0	0
Total Oct.	21	518	2	7	10	75	88
Total Sept.	26	106	7	9	10	76	86
Difference	5	412	5	2	0	1	2

WELLS COMPLETED

OHIO COUNTY

Hartford—E. P. Tally, James C. Ellis & Co. 5 35
Will Coleman, S. R. Berry & Co. 5 25
S. H. Haynes, S. H. Russell & Co. 1 dry

Wells completed 3
Production 60
Dry 1

DAVIESS COUNTY

Owensboro—J. P. Howard, S. A. Cobb & Co. 3 35
J. P. Howard, S. A. Cobb & Co. 4 8
L. R. Williams, Brenner & Adams 1 100
James Bros., Hoosier Drlg. Co. 1 dry

Wells completed 4
Production 143
Dry 1

HANCOCK COUNTY

Pellville—Near Victoria, Brewer & Thrasher 1 gas
Near Vicoria, Doug. Boiling 1 gas

Wells completed 2
Gas 2

McLEAN COUNTY

Calhoun—Dunn, Miller & Damron 3 100

HART COUNTY

LeGrande—Roberts, Jess Watts & Co. 1 20
Pig Wilson, Perkins Bros. 1 50
S. B. Coffe, Carpenter, Frost & Co. 1 40
Jess Puckett, unknown parties 1 50

Wells completed 4
Production 170

MUHLENBERG COUNTY

Greenville—Irvin Miller, Ohio Oil 1 gas
Will Lee, Ellis & Young 1 gas
J. L. Carey, Ellis & Young 1 gas

Wells completed 3
Gas 3

HENDERSON COUNTY

Sebree—Curry, Security Oil & Gas Co. 6 gas
Hardkins, Security Oil & Gas Co. 1 gas

Wells completed 2
Gas 2

WEBSTER COUNTY

Niagara—Aaron Freeman, Imperial Oil & Gas Products Co. 1 20
Aaron Freeman, Imperial Oil & Gas Products Co. 2 25

Wells completed 2
Production 45

TENNESSEE FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Putnam	0	0	0	0	0	1	1
Smith	0	0	0	0	0	1	1
Warren	0	0	0	0	0	1	1
Clay	0	0	0	0	0	2	2
Dickson	0	0	0	0	0	2	2
White	0	0	0	0	0	1	1
Lincoln	0	0	0	0	0	2	2
Overton	0	0	0	0	0	2	2
Cheatham	0	0	0	0	0	1	1
Robertson	0	0	0	0	0	1	1
Total Oct.	0	0	0	0	0	14	14
Total Sept.	0	0	0	0	0	14	14
Difference	0	0	0	0	0	0	0

ROCKY MOUNTAIN AREA

COLORADO

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Arapahoe	0	0	0	0	0	2	2
Elbert	0	0	0	0	0	3	3
Fremont	0	0	0	0	0	14	14
La Plata	1	50	0	0	1	2	3
Larimer	0	0	0	0	1	10	11
Las Animas	0	0	0	0	1	3	4
Moffat	0	0	0	0	2	2	4
Morgan	0	0	0	0	3	4	7
Rio Blanco	0	0	0	0	0	4	4
Routt	0	0	0	0	1	2	3
Weld	1	930	0	0	4	7	11
Miscellaneous	0	0	0	0	0	31	31
Total Oct.	2	980	0	0	13	84	97
Total Sept.	1	600	0	0	12	81	93
Difference	1	380	0	0	1	3	4

WELLS COMPLETED

13-6n-61 Briggs, Continental Oil Co. 1 930
27-33-12 Sanchez, McGarr Pet. Co. 1 50

Wells completed 2
Production 980

MONTANA

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Carbon	0	0	0	0	2	4	6
Cascade	0	0	0	0	0	3	3
Fergus	0	0	0	0	1	5	6
Glacier	2	0	0	3	2	11	13
Hill	0	0	0	0	1	3	4
Judith Basin	0	0	0	0	0	2	2
Liberty	0	0	0	0	1	7	8
Pondera	0	0	0	0	0	3	3
Rosebud	0	0	0	0	0	3	3
Teton	0	0	0	0	1	4	5
Toole	0	0	0	0	7	9	16
Miscellaneous	0	0	0	0	2	15	17
Total Oct.	3	0	0	3	17	69	86
Total Sept.	9	0	3	6	16	72	88
Difference	6	0	3	3	1	3	2

WELLS COMPLETED

33-36-5w Michaels, L. B. O'Neil, agent 2 gas
35-36-5w Teterud, L. B. O'Neill, agent 1 gas
9-35-5w State, L. B. O'Neill, agent 1 gas

Wells completed 3
Gas production 25,000,000

NEW MEXICO

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Chaves	0	0	0	0	0	2	2
De Baca	0	0	0	0	0	2	2
Eddy	1	0	1	0	1	4	5
Lea	0	0	0	0	4	6	10
McKinley	0	0	0	0	0	7	7
Rio Arriba	0	0	0	0	0	3	3
San Juan	2	75	1	0	0	9	9
San Miguel	0	0	0	0	0	5	5
Torrance	0	0	0	0	0	3	3
Miscellaneous	0	0	0	0	1	12	13
Total Oct.	3	75	2	0	6	53	59
Total Sept.	5	50	4	0	6	48	54
Difference	2	25	2	0	0	5	5

WELLS COMPLETED

20-29-11 J. F. Cross et al 4 abd
2-29-19 Continental Oil Co. 25 75
5-19-28 State, Flynn, Welch & Yates 60 dry

Wells completed 3
Production 75
Dry and abandoned 2

UTAH

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Total Oct.	0	0	0	0	1	19	20
Total Sept.	0	0	0	0	1	19	20
Difference	0	0	0	0	0	0	0

WYOMING

Summary of Field Operations

County—	Comp.	Prod.	Dry	Gas	Rig	Dlg.	Ttl.
Big Horn	0	0	0	0	3	2	
Carbon	1	0	1	0	1	8	9
Converse	0	0	0	0	1	3	4
Crook	0	0	0	0	0	1	1
Fremont	0	0	0	0	0	5	5
Hot Springs	0	0	0	0	0	2	2
Johnson	0	0	0	0	0	1	1
Lincoln	0	0	0	0	0	2	2
Natrona	1	0	1	0	3	8	11
Niobrara	0	0	0	0	0	2	2
Park	0	0	0	0	2	8	10
Sheridan	0	0	0	0	0	1	1
Sweetwater	0	0	0	0	2	5	7
Sublet	0	0	0	0	0	7	7
Uinta	0	0	0	0	0	6	6
Washakie	0	0	0	0	0	1	1
Weston	4	180	2	0	0	12	12
Total Oct.	6	180	4	0	9	74	83
Total Sept.	7	2,695	1	0	11	77	88
Difference	1	2,695	3	0	2	3	5

WELLS COMPLETED

26-46-64 Central Oil Co. 1 dry
23-46-64 Tom Don et al 3 50
31-46-64 Carl Cundy 2 dry
16-46-64 Fowler, Riggs Oil Co. 1 130
5-39-78 Western Producers, Inc. 1 dry
3-25-88 Producers & Refiners 3 dry

Wells completed 6
Production 180
Dry and abandoned 4

EASTERN FIELDS

Summary of Completed Work

Fields—	Comp.	Prod.	Dry	Gas
Allegany	14	54	2	0
Bradford	46	86	0	0
Venango-Clarion	7	4	0	3
Butler-Armstrong	1	1	0	0
Middle Field	5	3	0	0
Tioga-Wayne	10	0	1	9
S.W. Pennsylvania	4	10	1	2
Southeast Ohio	20	31	7	8
West Virginia	26	71	5	16
Total October	133	265	16	38
Total September	134	237	30	54
Difference	1	28	14	16

Summary of Work Under Way

Fields—	Rigs	Drlg.	Ttl.
Allegany	3	14	17
Bradford	11	33	44
Venango-Clarion	0	11	11
Butler-Armstrong	0	3	3
Middle Field	0	2	2
Tioga-Wayne	9	69	78
S.W. Pennsylvania	3	9	12
Southeast Ohio	11	26	37
West Virginia	14	46	60
Total October	51	213	264
Total September	39	161	200
Difference	12	52	64

WELLS COMPLETED

ALLEGANY

Fee, Ryder & Richmond Oil Corp. 2
Fee, Miller Brothers et al 7
Fee, Miller Brothers et al 20
Fee, Mary Lippert 4
Fee, C. M. Lippert et al 2
Fee, J. H. Brahaney 1
Warters, C. M., and F. J. Lippert 4
Fee, Gibson & Merry 1
Fee, A. H. Ashworth 2
Fee, C. L. Wann et al 2 pressure
Leon A. Childs, Martin Bros. dry
South Penn, Bradley and Streter dry
Fee, R. J. Dermitt 5
Fee, Gilligan and Dermitt 5

Completions 14
Production 54
Dry 2
Pressure 1

BRADFORD

Fee, E. D. Kepner Oil Co. 5
Fee, E. D. Kepner Oil Co. pressure
Fee, V. G. Smith 3
Fee, Grow Farm Oil Co. 3
Weston, G. C. Rice et al 2
Fee, Forest Oil Corp. 1
Fee, Forest Oil Corp. 1
Fee, Forest Oil Corp. 1
Fee, Forest Oil Corp. pressure
Fee, Forest Oil Corp. pressure
Fee, Forest Petroleum Corp. 1
Fee, Forest Petroleum Corp. 1
Fee, Forest Petroleum Corp. 1
Fee, Forest Petroleum Corp. pressure
Fee, Forest Petroleum Corp. pressure
Fee, Forest Petroleum Corp. pressure
Bingham 321, Andrus & MacDowell 133 5
Freeman, Stuckel & Truman 43 2
Fee, Lincoln & Brink 48 1
Corwin, Corwin & Gallagher 11 1
Gill, Dempsey, Slaven and Edgar 1
Burdick, South Penn Oil Co. pressure
Johnson, J. H. Brahaney 2
Wright, Harding 3
Fee, South Penn Oil Co. pressure
Fee, C. W. Sharpe et al 4
Fee, C. W. Sharpe et al 3
DeGolier, Healey Petroleum Corp. 1
Morris, H. L. Morris 2
Morris, H. L. Morris 1
Quintuple, Forest Petroleum Corp. 6
Quintuple, Forest Petroleum Corp. 1
Fee, Moses Sullivan 5
Fee, Olean Petroleum Co. et al 1
Glenn, S. E. Elder & Co. 1
Melvin, South Penn Oil Co. 2
Mitchell, Bradford Producing Co., Inc. 15
Borden, T. P. Thompson, Jr. pressure
Duck, Sloan & Zook Oil Co. 1 pressure
Quintuple, Bovaird and Enright 1
Quintuple, Healey Petroleum Corp. 1
Griffin, Carl W. Morris 1
Quintuple, Ione D. Miller et al 5
Hartarella, S., and L. Tartarella 1
Conklin, Ball and Ryan 1

Completions 46
Production 86
Pressure 11

VENANGO-CLARION

Helsel, C. F. & C. Oil & Gas Co. 13 1
Dunlap, Franklin Trust Co. 31 1
Shreffler, Catherine M. and Alice E. Shreffler 3 1
McLaughlin, Thomas McLaughlin 25 1
Steiner, Fryburg Motor Co. 1 gas
Heckathorne, United Natural Gas Co. 4, 11 gas
Sporer, W. B. and F. E. Kapp 6 gas

Completions 7
Production 4
Gas 3

BUTLER-ARMSTRONG

Ethridge, Ethridge and Pfiter 1 1

Completions 1
Production 1

MIDDLE FIELD

Lot 3,290, Hoskins, Roeder et al 92 1
Norton, Kahle Oil Co. 5
Kapp, T. H. Kervin, Jr. pressure
Dunham, A. F., and W. N. Dunham 12 1
T. & W. O. Co., A. E. and W. C. Tompsett 73 1

Completions 2
Production 5
Pressure 1

TIOGA-WAYNE

Russell, Penn United Gas Co. gas
Smith, New York Natural Gas Corp. gas
Crosby, Lycoming Natural Gas Corp. gas
Earnest, Flickner and Canfield gas
Hays, Belmont Quadrangle Drilling Corp. gas
Weilbolt, Cayuga Gas Co. dry
Miles, Belmont Quadrangle Drilling Corp. gas
Olszowski, Tri State Oil & Gas Corp. gas
Booth, Hungerford & Co. gas
Dencemberg, Williamsport Oil & Gas Co. gas

Completions 10
Dry 1
Gas 9

SOUTHWEST PENNSYLVANIA COMPLETIONS

GREENE COUNTY

Scott, J. B. Orndoff 1 10

WASHINGTON COUNTY

McCauslin, Hopp Oil & Gas Co. 1 gas
Woodruff, Potts Brothers 1 gas
Inglefield, C. V. Inglefield & Co. 1 dry

SOUTHEAST OHIO COMPLETIONS

ATHENS COUNTY

Young, Standard Natural Gas Co. 2 gas

COSHOCTON COUNTY

Allen, M. F. Whitehill 1 dry

GUERNSEY COUNTY

Virtue, Keith Brothers 1 8

JEFFERSON COUNTY

Lee, N. A. Sutton Oil Co. 2 1

LICKING COUNTY

Hoover, W. J. McClay et al 3 gas
Kreager, Wehrle Co. 1 gas

MEDINA COUNTY

Franks, E. R. Edson & Son Co. 26 dry
Packard, E. R. Edson & Son Co. 20 dry
Fitzer, O. K. O. Oil & Gas Co. 3 5
Franks, E. R. Edson & Son Co. 27 15
Packard, E. R. Edson & Son Co. 21 dry
Ross, E. R. Edson & Son Co. 29 2
Essig, O. K. O. Oil & Gas Co. 48 dry

MUSKINGUM COUNTY

Morningstar, Hopewell Fuel & Gas Co. 1 gas
Swingle, Pure Oil Co. 1 gas
Stark Land Co., Atha Oil Co. 2 dry
Atha, Atha Oil Co. 4 gas

VINTON COUNTY

Throckmorton, Ohio Fuel Gas Co. 1 gas

WASHINGTON COUNTY

Martin, F. M. Russel et al 3 dry
Reft, Otto Heldman et al 1 gas

WEST VIRGINIA COMPLETIONS

BOONE COUNTY

Federal Coal Co., Pure Oil Co. 52 gas
Hill, Jones and Hess 1 dry

CABELL COUNTY

Holton, Madison Gas Co. 2 gas

CALHOUN COUNTY

Gunn, F. F. McIntosh 1 gas
Freshour, C. A. Jarvis et al 1 gas
Jackson, Bowser Oil Co. 5 gas
Force, Ed Smith et al 1 dry
Hardman, F. F. McIntosh 1 gas
Hardman, M. F. Crawley 1 3
Jackson, T. J. and A. H. Jackson 2 gas

GILMER COUNTY

Fisher, Patsy Crude Oil Co. et al 1 16
Stout, McCall et al 3 gas
Stump, Chartiers Oil Co. gas

KANAWHA COUNTY

Thomas, Winifrede Co. 1 gas

LEWIS COUNTY

Crothers, Hope Const. & Ref. Co. 1 dry

LINCOLN COUNTY

Brumfield, Turtle Lick Gas Co. 1 gas

MARSHALL COUNTY

McGinnis, Frye and McCracken 2 gas

MARION COUNTY

Glover, Funk and Glover 3 dry

MINGO COUNTY

Stroud, F. H. Yates 1 50
Central Trust Co., United Fuel Gas Co. 4,327 gas

WAYNE COUNTY

Ronk, Chartiers Oil Co. 2 1
Wilson heirs, Wayne United Gas Co. 46 gas

WETZEL COUNTY

Joliffe, Manufacturers L. & H. Co. 2,190 1
Himelrick, Pgh. & W. Va. Gas Co. 5,401 gas

WIRT COUNTY

Rex, F. S. Andrews 12 dry
Lieving, R. C. Wagner & Co. 2 gas

INDIANA FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Huntington	0	0	0	0	0	2	2
Gibson	1	0	1	0	0	0	0
Pike	1	0	1	0	1	2	3
Daviess	0	0	0	0	0	7	7
Sullivan	2	0	1	1	0	2	2
Warrick	0	0	0	0	0	1	1
Spencer	1	0	1	0	0	7	7
Perry	0	0	0	0	2	8	10
Marshall	0	0	0	0	1	1	2
Lagrange	0	0	0	0	0	1	1
Knox	1	0	1	0	0	5	5
Putnam	0	0	0	0	0	1	1
Posey	0	0	0	0	0	1	1
Laporte	0	0	0	0	0	1	1
St. Joe	0	0	0	0	0	1	1
DeKalb	0	0	0	0	0	1	1
Rush	0	0	0	0	0	2	2
Elkhart	0	0	0	0	1	0	1
Vandeberg	0	0	0	0	1	0	1
Hancock	0	0	0	0	0	1	1
Hamilton	0	0	0	0	0	2	2
Shelby	0	0	0	0	0	1	1
Dearborn	1	0	1	0	0	1	1
Dubois	0	0	0	0	0	1	1
Harrison	0	0	0	0	0	2	2
Crawford	0	0	0	0	1	0	1
Henry	1	0	0	1	0	1	1
Clay	0	0	0	0	0	1	1
Greene	0	0	0	0	0	1	1
Switzerland	0	0	0	0	0	1	1
Total Oct.	8	0	6	2	7	55	62
Total Sept.	6	0	2	3	6	54	60
Difference	2	0	3	1	1	1	2

WELLS COMPLETED

JAY COUNTY

Wabash—J. H. Barr, H. Pontius 1, 2, 3, 4, 5 ..... abd

GIBSON COUNTY

Barton—George W. Harper, Gem Oil Corp. 1 ..... dry

PIKE COUNTY

Patoka—John D. Grimes, Murphy Oil 1 abd
Clay—J. W. Peed, Indiana Southwestern Gas Corp. 1 ..... dry

Wells completed 1
Dry 1
Abandoned 1

SPENCER COUNTY

Huff—Wm. Grass, I. A. Polhamus 1 ..... dry

SULLIVAN COUNTY

Turman—C. L. Davis No. 2, C. W. Scott 5 ..... dry
Curry—Mary Drak, James C. Ellis 1 ..... gas

Wells completed 2
Dry 1
Gas 1

KNOX COUNTY

Busseron—E. W. House, James H. Gardner 1 ..... dry

DEARBORN COUNTY

Kelso—Chris Schamacker, Dearborn Dev. Synd. 1 ..... dry

HENRY COUNTY

Spiceland—Henry Foster, Bert Kimmerman 1 ..... gas

MICHIGAN FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Isabella	4	4,150	0	1	25	32	57
Midland	2	5,400	0	0	13	18	31
Clare	0	0	0	0	3	2	5
Mecosta	0	0	0	0	1	0	1
Lake	0	0	0	0	0	2	2
Cass	0	0	0	0	0	2	2
Kent	0	0	0	0	1	3	4
Ottawa	0	0	0	0	1	1	2
Oceana	0	0	0	0	1	6	7
Bay	0	0	0	0	1	1	2
Mason	0	0	0	0	0	4	4
Newaygo	0	0	0	0	0	5	5
Emmett	0	0	0	0	1	0	1
Eaton	0	0	0	0	1	0	1
Kalkasky	0	0	0	0	1	1	2
Iosco	0	0	0	0	2	0	2
Monroe	9	0	0	0	1	1	2
Lenawee	0	0	0	0	0	1	1
Washtenaw	0	0	0	0	0	1	1
Wayne	4	0	4	0	0	0	0
Missauke	0	0	0	0	1	0	1
Delta	0	0	0	0	1	0	1
Montmorency	0	0	0	0	1	0	1
Van Buren	0	0	0	0	0	2	2
Sanilac	0	0	0	0	2	0	3
Gratiot	5	0	0	5	2	1	3
Shiawassee	0	0	0	0	2	2	4
Livingston	0	0	0	0	1	1	2
Allegan	0	0	0	0	0	6	6
Leelanau	0	0	0	0	1	0	1
Osceola	0	0	0	0	2	0	2
St. Clair	0	0	0	0	1	0	1
Genessee	0	0	0	0	1	0	1
Alpena	0	0	0	0	0	1	1
Cheboygan	0	0	0	0	0	1	1
Kalmazoo	0	0	0	0	0	1	1
Huron	0	0	0	0	1	0	1
Oakland	0	0	0	0	0	1	1
Macomb	0	0	0	0	1	0	1
Total Oct.	15	9,550	4	6	70	96	166
Total Sept.	20	6,700	8	6	70	101	171
Difference	5	2,850	4	0	0	5	5

WELLS COMPLETED

ISABELLA COUNTY

Vernon—John Brief, Mellon-Pollock Oil 1 750
Thayer, Mellon-Pollock Oil 1 2400
Woods, Meridian Oil & Gas 1 1000
Homer Campbell, E. Brown Oil & Development 1 ..... gas

Wells completed 4
Production 4150
Gas 1

MIDLAND COUNTY

Greendale—A. Bernard, Pure Oil 1 3000
Noah Skinner, Gordon Oil 3 2400

Wells completed 2
Production 5400

WAYNE COUNTY

Van Buren—Ira Riggs, G. E. LeVeque 1 dry
D. W. Ross, D. W. Ross 1 ..... dry
Sumpter—Bertchinger, Bertchinger 1 ..... dry
Berry, Berry Corner Co. 1 ..... dry

Wells completed 4
Dry 4

GRATIOT COUNTY

Breckenridge-Kerr, Miller & Combs 1 .. gas
Hamilton—Ray Durman, Earl E. Durham 1 ..... gas
Zimmerman, Wittmer Oil & Gas 1 .. gas
Gibbs, Bacon & Co. 1 ..... gas
Wheeler—Cornwall heirs, Maeston Oil 1 gas

Wells completed 5
Gas 5

ILLINOIS FIELDS

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Clark	0	0	0	0	0	2	2
Coles	0	0	0	0	0	1	1
Edgar	0	0	0	0	0	1	1
Crawford	0	0	0	0	2	3	5
St. Clair	2	2	1	0	0	0	0
Randolph	0	0	0	0	0	2	2
Monroe	0	0	0	0	0	2	2
Washington	0	0	0	0	0	1	1
Boone	0	0	0	0	0	1	1
Madison	0	0	0	0	0	2	2
Marion	0	0	0	0	0	1	1
Jefferson	0	0	0	0	0	1	1
Total Oct.	2	2	1	0	2	17	19
Total Sept.	2	0	2	0	2	16	18
Difference	0	2	1	0	0	1	1

WELLS COMPLETED

ST. CLAIR COUNTY

Sugar Loaf—Oliver Anderline, Hans Wolf 3 2
Wm. Scheifler, Ritter & Co. 1 ..... dry
Chaplain-Johnson lots, C. C. Bundy & Co. 1 ..... abd
E. C. Hackamer, C. C. Bundy & Co. 1 abd
C. Baker, C. C. Bundy & Co. 1 ..... abd
Odd Fellows lot, C. C. Bundy & Co. 1 abd
S. Jackson lot, Dupo Oil & Dev. Co. 1 abd

Wells completed 2
Production 2
Dry 1
Abandoned 5

LIMA FIELD

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Hancock	1	20	0	0	0	1	1
Allen	0	0	0	0	0	1	1
Seneca	6	0	0	6	0	4	4
Mercer	0	0	0	0	0	1	1
Lucas	3	50	0	0	0	2	2
Ottawa	1	0	0	1	0	2	2
Hardin	3	5	2	0	0	2	2
Henry	1	0	0	1	0	0	0
Logan	2	0	0	2	0	0	0
Shelby	1	10	0	0	0	0	0
Putnam	0	0	0	0	0	1	1
Wyandot	5	0	2	3	1	0	1
Darke	1	1	0	0	0	1	1
Total Oct.	24	86	4	13	1	15	16
Total Sept.	10	15	1	8	3	23	26
Difference	14	71	3	5	2	8	10

WELLS COMPLETED

WOOD COUNTY

Plain—Case & Case, Murray B. Chidester 4 ..... abd
Bloom—Wm. Bishop, Ohio Oil 1 ..... abd
Solar Ref. Co., Ohio Oil 12 ..... abd

Abandoned 4

HANCOCK COUNTY

Portage—W. H. Roberts, Ohio Oil 9 .. abd
J. E. Huntington, Ohio Oil 1 ..... abd
J. B. Bair, Ohio Oil 4 ..... abd
C. Hillshafer, Ohio Oil 12 ..... abd
Allen—P. Alexander, Ohio Oil 7, 28, 39 abd
Liberty—Justice Chase, Ohio Oil 31 .. abd
Wm. Cusac, Ohio Oil 10, 16 ..... abd
Peter Price, Ohio Oil 10 ..... abd
Wm. Reminger, Ohio Oil 8 ..... abd
Wm. Sawyer, Wm. M. Stitt & Co. 3, 5, 6, 7 ..... abd
Joe Ernst, L. Cramer 4 20

Wells completed 1
Production 20
Abandoned 16

SANDUSKY COUNTY

Scott—Jennings No. 2, D. L. Keiser 1 abd
G. W. Plants, D. L. Keiser 1 ..... abd
C. J. Overmyer, George A. and John Willard 8 ..... abd
J. C. Fisher, George A. and John Willard 1, 7 ..... abd
Joseph Klofenstein, George A. and John Willard 4, 7, 9 ..... abd
Stitt, Pool & Sager, Robert H. Stitt & Co. 10, 14 ..... abd
Seima Ryder, Jay Knauss 2, 4 ..... abd
R. F. Bowe, H. Bowe 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 abd

Abandoned 30

SENECA COUNTY

Hopewell—Mary Getuldig, J. H. Murphy & Co. 4 ..... gas
Liberty—R. M. Martin, McKinney Bros. 2 ..... gas
Floy Broomfield, Neath & Geddis 1, 2 gas
D. L. Shaull, Dora L. Shaull 1 ..... gas
Jacob Kimmet, Muncy Valley O. & G. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 ..... abd
Seneca—J. A. and H. G. Haines, Recovery Oil & Gas 1 ..... gas

Wells completed 6
Gas 6
Abandoned 10

LUCAS COUNTY

Monclova—D. T. Teft, Dillon & McFrederick 1 30
D. T. Teft, Dillon & McFrederick 2 .. 15
Henry Butz, Dillon & McFrederick 1 5

Wells completed 3
Production 50

OTTAWA COUNTY

Erie—Qualman, Emery Qualman 1 ..... gas

HARDIN COUNTY

Cessna—Grant Geiger, Wiser Oil 5 ..... dry
Jacob Steiner, Wiser Oil 1 5
Jackson—Wm. F. Kurtz, Kurtz Gas 1 .. dry

Wells completed 3
Production 5
Dry 2

HENRY COUNTY

Richfield—L. M. Jones, Lake Shore & S. W. Oil & Metal Co. 1 ..... gas

LOGAN COUNTY

Richland—Steve O. Ammons, Simms Oil 1 ..... gas
Washington—R. S. Patterson, Lake Shore and S. W. Oil & Metal 1 ..... gas

Wells completed 2
Gas 2

SHELBY COUNTY

Cynthian—P. Gaffena, W. A. Rucker Oil 3 10

WYANDOT COUNTY

Tymochtee—Bowman-Brillhart, McPherson, Cook & Miller 1 ..... gas
Jacob Fruth, O'Neal & Co. 1 ..... dry
Flaxonhead, Temple & Kennedy 1 .. dry
Crawford—John Neiderkoken, O'Neal & Co. 1 ..... gas
Bridge—Anna L. Sheradan, R. W. Kurt & Co. 2 ..... gas

Wells completed 5
Dry 2
Gas 3

DARKE COUNTY

Miss'ssinewa—Charles Miller, Adrain Tester 1 1

CENTRAL OHIO

Summary of Field Operations

	Comp.	Prod.	Dry	Gas	Rig	Dig.	Ttl.
Ashland	3	0	1	2	2	3	5
Lorain	3	0	0	3	2	4	6
Medina	12	186	4	0	3	4	7
Wayne	2	0	1	1	0	0	0
Holmes	0	0	0	0	0	1	1
Cuyahoga	0	0	0	0	0	1	1
Richland	1	0	1	0	0	1	1
Coshocton	1	2	0	0	0	1	1
Summitt	0	0	0	0	0	3	3
Licking	2	0	0	0	2	3	5
Muskingum	5	0	1	4	2	8	10
Athens	2	4	1	0	2	6	8
Tuscarawas	1	0	0	1	2	3	5
Stark	11	0	1	10	7	34	41
Fairfield	2	0	1	1	0	1	1
Knox	5	3	2	2	1	0	1
Guernsey	3	10	0	2	4	4	8
Belmont	5	1	0	4	0	5	5
Gallia	0	0	0	0	0	2	2
Scioto	0	0	0	0	0	2	2
Pike	0	0	0	0	0	2	2
Carroll	0	0	0	0	1	5	6
Columbiana	0	0	0	0	0	1	1
Total Oct.	58	206	13	32	29	94	123
Total Sept.	48	231	17	24	59	101	130
Difference	10	25	4	8	0	7	7

WELLS COMPLETED

ASHLAND COUNTY

Orange—A. and W. Weisman, Ohio Fuel Gas 2-5,541 ..... gas
C. L. Cline, Ohio Fuel Gas 1-5,552 ... gas
Milton—D. A. Phillips, Commonwealth Gas Corp. 1 ..... dry

Wells completed 3
Dry 1
Gas 2

LORAIN COUNTY

Carlisle—Max Handrosh, Ohio Fuel Gas 1-5,553 ..... gas
Columbia—Henry E. Cletzer, Ohio Fuel Gas 1-5,556 ..... gas
Arthur D. Crocker, Ohio Fuel Gas 2-5,564 ..... gas

Wells completed 3
Gas 3

MEDINA COUNTY

Chatham—C. and E. Clapp, Preston Oil 19-1,489 23
Kate Fetzer, Oko Oil & Gas Co. 3 5
George W. Packard, Edson Sons Co. 20 dry
George W. Packard, Edson Sons Co. 21 dry
George W. Packard, Edson Sons Co. 22 10
George W. Packard, Edson Sons Co. 23 25
Marcus A. Frank, Edson Sons Co. 27 .. 50
Marcus A. Frank, Edson Sons Co. 28 .. dry
Marcus A. Frank, Edson Sons Co. 29 .. 45
Marcus A. Frank, Edson Sons Co. 30 .. 18
Daniel Ross, Edson Sons Co. 17 10
Homer—Dick Barnes, Commonwealth Gas Corp. 1 ..... dry

Wells completed 12
Production 186
Dry 4

RICHLAND PARISH

Worthington—Leah Clever, Ohio Fuel Gas Co. 1-5,359 ..... dry

COSHOCTON COUNTY

Perry—Myers & Mossholder, Murphy & Co. 1 2

WAYNE COUNTY

Chester—Thomas Arnold, Harmon & George 3 ..... gas
W. A. Firestone, Hulse-Kundtz, Inc., 3 ..... dry

Wells completed 2
Dry 1
Gas 1

LICKING COUNTY

Hopewell—Charles F. Kreager, Wehrle Gas 1 ..... gas
Perry—Emmett Hover, McClay Bros. 4 gas

Wells completed 2
Gas 2

MUSKINGUM COUNTY

Washington—H. A. Mangold, Ohio Fuel Gas 1-5,551 ..... gas
Stark Land Co., Atha Co. 2 ..... dry
Brush Creek—Phil Morningstar, Hopewell Gas Co. 2 ..... gas
Walter E. Helriggle, Pure Oil Co. 1N gas
Falls—W. H. Atha, W. H. Atha 5 ..... gas

Wells completed 5
Dry 1
Gas 4

ATHENS COUNTY

Carthage—Ida B. Davis, Hope Construction & Ref. Co. 2 4
Troy—Charles Cole, Ohio Fuel Gas Co. 2-5,565 ..... dry

Wells completed 2
Production 4
Dry 1

TUSCARAWAS COUNTY

Sandy—George J. Martley, Local Co. 1 gas

STARK COUNTY

Jackson—Levi K. Smoyer, Ohio Fuel Gas Co. 1-5,526 ..... gas
P. J. Bricker, Ohio Fuel Gas Co. 1-5,537 ..... dry
Bruce Crissinger, Ohio Fuel Gas Co. 1-5,545 ..... gas
Bruce Crissinger, Ohio Fuel Gas Co. 2-5,546 ..... gas
H. B. Fawcett, East Ohio Gas Co. 2 ..... gas
Mary Hinkel, East Ohio Fuel Gas Co. 1 ..... gas
W. and D. Froman, Medford Oil & Gas 1 ..... gas
W. A. Haymaker, Brendall & Co. 2 .. gas
J. C. Steiner, Brendall & Co. 2 ..... gas
F. L. Kirchofer, Boettler & Co. 1 .. gas
H. M. Schuffell, Wiser Oil Co. 1 ..... gas

Wells completed 11
Dry 1
Gas 10

FAIRFIELD COUNTY

Pleasants—S. H. Anderson estate, City Natural Gas Works 5 ..... gas
Berne—W. M. and H. Brucker, City Natural Gas Works 2 ..... dry

Wells completed 2
Dry 1
Gas 1

KNOX COUNTY

Union—J. H. Colopy, Hulse-Kundtz, Inc., 4 ..... gas
J. H. Colopy, Hulse-Kundtz, Inc., 5 .. gas
Warren Farmer, H. E. Perkins 1 3
Jackson—J. and P. Allen, Whitehill Oil 1 ..... dry
H. Hoagle, Emerald Petroleum 1 ..... dry

Wells completed 5
Production 3
Dry 2
Gas 3

GUERNSEY COUNTY

Wheeling—Wm. T. Virtue, Keith Bros. 1 10
Adams—James Mehaffey, George McLaughlin 1 ..... gas
Jackson—John Brock, W. B. Urban & Co. 2 ..... gas

Wells completed 3
Production 10
Gas 2

BELMONT COUNTY

Somerset—F. S. and Nellie Rossiter, Teller & Co. 4 1
W. C. Wheatley, Peters, Purdy & Co. 2 gas
A. J. Burkhart, Bradfield & Hardwick 1 ..... gas
S. P. Butler, Washmuth, Callahan & Co. 1 ..... gas
Anthony Burkhart, J. L. Jeffries & Co. 1 ..... gas

Wells completed 5
Production 1
Gas 4

BOOK ON GEOPHYSICS

For those who are interested in geophysics and its application to the investigation of underground formations and mineral deposits a new book has recently been published by Seismos G.M.B.H., Hanover, Germany, and written by Prof. Dr. L. Mintrop. This is the second book of a series, the first having been issued in 1922, and is entitled "Exploration of Rock Strata and Mineral Deposits by the Seismic Method."

The second book is much more complete and deals with the history of the Seismic method and in it Doctor Mintrop traces the development and application of the elastic wave method from its first application by Reginald A. Fessenden, Boston, Mass., in 1914 and including the methods devised and patented during the succeeding years down to 1929. Copies of these books can be secured by addressing the Seismos G.M.B.H., Hanover, Germany, and it is understood they will be furnished without cost.

Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS
Pipe Line Statement for September

RUNS

	Month (bbls.)	Dly av. (bbls.)
Prairie P. L. Co.*	528,000	17,600
Gulf P. L. Co.	1,058,467	35,282
Texas P. L. Co.	378,133	12,604
Magnolia P. L. Co.	1,134,918	37,831
Empire P. L. Co.	1,262,766	42,126
Cosden P. L. Co.	564,030	18,803
Stanolind P. L. Co.*	1,245,000	41,500
Oklahoma P. L. Co.	2,074,325	69,144
Other lines*	3,123,000	104,100
Total September	11,369,639	378,990
Total August	13,029,328	419,301
Difference	1,659,639	40,311

SHIPMENTS

Prairie P. L. Co.	3,762,895	125,430
Gulf P. L. Co.	1,746,138	58,204
Texas P. L. Co.	1,079,849	35,995
Magnolia P. L. Co.	920,128	30,671
Empire P. L. Co.	1,857,547	61,918
Cosden P. L. Co.	711,942	23,731
Stanolind P. L. Co.	3,454,590	115,153
Oklahoma P. L. Co.	2,206,570	73,552
Other lines*	4,350,000	145,000
Total September	20,069,659	669,654
Total August	23,270,345	750,656
Difference	3,200,686	81,002

STOCKS

Prairie O. & G. Co.*	35,593,000
Gulf P. L. and Gypsy Oil Co.	7,942,451
The Texas Company	2,784,096
Magnolia Petroleum Co.	6,904,382
Empire P. L. Co.	3,488,478
Mid-Continent Petroleum Corp.	3,348,098
Stanolind Crude Oil Pur. Co.*	15,232,000
Oklahoma P. L. Co.	1,054,256
Carter Oil Co.	6,882,733
Other lines*	15,408,000
Total September	98,657,494
Total August	105,427,880
Difference	6,770,386

*Estimated.

EASTERN PIPE LINE REPORT
FOR MONTH OF OCTOBER

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky, Illinois, Indiana and Michigan for September and October:

	Sept., 1931	Oct., 1931
Nat. Transit	145,864.04	154,511.51
S. W. Pa. P. L.	79,823.98	79,162.91
Eureka P. L.	306,199.28	321,800.33
Buckeye P. L. (Macksburg)	277,205.53	282,641.23
Buckeye P. L. (Cleveland)	12,190.61	12,576.07
Buckeye P. L. (Lima, etc.)	82,263.82	85,128.77
Indiana P. L.	2,703.99	2,549.84
Cumberland P. L.	145,866.70	.....
N. Y. Transit	30,392.22	36,518.13
Tide Water P. L.	22,802.35	23,220.70
Pure Oil	292,400.07	313,618.79
Stoll Oil Ref.	29,470.48	69,655.93
Bradford Tran.	413,169.77	476,204.68
Ashland Ref.	.....	144,886.55
Total	1,840,352.84	2,002,475.44
Daily average	61,345.09	64,595.98

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for September and October:

	Sept., 1931	Oct., 1931
Nat. Transit	499,112.79	582,367.42
S. W. Pa. P. L.	423,403.26	479,783.62
Eureka P. L.	372,988.75	354,253.27
Buckeye P. L. (Macksburg)	234,573.66	284,152.1[illegible]
Buckeye P. L. (Cleveland	1,944.16	1,712.3[illegible]
Buckeye P. L. (Lima, etc.)	1,802,206.78	1,712,258.54
Indiana P. L.	909,359.87	856,217.10
Cumberland P. L.	115,316.63	.....
Southern P. L.	70,722.76	69,625.59
N. Y. Transit	171,412.21	191,559.68
Northern P. L.	255,413.44	168,179.98
Tide Water P. L.	465,676.21	516,207.68
Pure Oil	222,738.09	268,733.25
Bradford Tran.	480,695.64	559,039.81
Tuscarora	500,545.93	346,805.6[illegible]
Ashland Ref.	.....	144,886.55
Total	6,526,110.18	6,535,782.71
Daily average	217,537.01	210,831.70

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of September and October:

	Sept., 1931	Oct., 1931
Nat. Transit	749,274.20	673,029.18
S. W. Pa. P. L.	404,189.10	435,631.21
Eureka P. L.	1,445,855.17	1,162,617.18
Buckeye P. L. (Macksburg)	347,122.32	307,630.86
Buckeye P. L. (Cleveland)	39,616.20	36,248.81
Buckeye P. L. (Lima, etc.)	2,778,403.92	2,659,895.96
Indiana P. L.	523,814.43	551,521.77
Cumberland P. L.	69,282.55	64,611.76
Southern P. L.	219,384.72	233,968.56
N. Y. Transit	108,612.34	99,292.01
Northern P. L.	208,028.03	300,534.94
Tide Water P. L.	924,216.84	1,015,782.92
Pure Oil	485,055.55	556,871.54
Tuscarora	11,544.91	11,658.70
Bradford Trans.	178,031.09	308,399.51
Total	8,492,431.43	8,417,694.91
Decrease	700,025.90	74,736.52

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of September and October, showing gross stocks of the above fields:

	Sept., 1931	Oct., 1931
Pennsylvania	3,054,494.51	3,031,430.00
Lima	664,893.87	619,693.95
Kentucky	79,690.06	75,019.27
Mid-Continent	4,202,724.97	4,145,615.17
Illinois	15,643.58	.....
Michigan	474,984.44	545,936.52
Total	8,492,984.44	8,417,694.91

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1928	1929	1930	1931
January	52,904	51,749	75,907	53,939
February	57,002	51,833	79,256	55,163
March	57,485	54,252	76,083	54,331
April	56,812	58,444	84,536	54,914
May	62,067	59,902	70,546	54,344
June	58,230	58,333	75,420	54,110
July	57,144	66,087	68,921	50,723
August	57,745	66,087	54,291	51,503
September	53,487	67,315	56,595	61,345
October	58,100	76,093	58,179	64,595
November	53,865	74,831	52,332	.....
December	52,025	74,561	53,999	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1928	1929	1930	1931
January	146,465	165,721	217,623	175,369
February	167,368	159,387	224,355	183,494
March	158,883	161,474	228,846	189,508
April	172,935	169,737	241,845	191,450
May	180,559	184,281	248,383	199,247
June	188,024	185,404	234,401	221,155
July	189,470	194,763	207,094	211,632
August	192,853	194,946	205,506	224,166
September	194,128	201,214	193,999	217,537
October	176,000	191,367	157,675	210,8[illegible]
November	176,898	202,743	146,638	.....
December	173,572	186,257	143,001	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1929	1930	1931
January	7,596,564	12,220,045	11,831,092
February	8,738,835	12,991,561	11,506,489
March	9,002,058	13,247,217	11,012,162
April	8,978,172	13,233,961	11,044,487
May	8,903,560	13,052,953	10,728,239
June	8,921,275	13,396,855	9,903,349
July	9,211,565	13,268,562	9,569,849
August	9,440,643	13,047,051	9,192,457
September	9,443,067	12,812,018	8,492,431
October	9,441,101	12,437,553	8,417,694
November	9,868,538	11,851,380	.....
December	11,253,953	11,751,952	.....

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, November 1	451,188.86
Runs from wells	474,903.43
Regular deliveries	304,925.73
Other deliveries	260,021.90

The amount of Illinois oil run by the Tide Water Pipe Co. in October was 23,220.70 bbls. Deliveries were 20,909.22 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1931—	Runs	Deliveries
October	498,124.13	325,834.95
1930—		
January	543,387.95	498,293.93
February	548,416.33	414,536.59
March	631,944.49	469,119.53
April	530,074.22	509,304.60
May	605,147.37	504,069.84
June	572,662.57	468,658.81
July	604,529.54	388,454.47
August	594,642.12	375,742.43
September	457,001.11	371,691.63
October	478,442.12	320,688.73
November	422,794.68	355,403.12
December	556,418.78	363,719.55
1931—		
January	468,429.04	669,573.19
February	429,284.54	461,262.85
March	424,638.23	356,663.26
April	421,814.98	282,532.65
May	433,231.80	322,513.95
June	510,805.78	320,258.13
July	520,009.38	289,219.05
August	476,623.56	393,231.06
September	492,183.83	323,012.50

Tide Water Pipe Co., Ltd., also delivered in October, 119,981.53 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA CRUDE AND REFINED OIL AT ATLANTIC AND GULF PORTS

Average barrels per day in 1930-31—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans, Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	6,300	6,400	25,600	13,400	9,567	61,267	.....	.....	.....	.....	2,435	63,700
October	3,516	3,065	27,358	16,419	4,903	54,161	.....	.....	.....	.....	5,355	59,516
November	8,367	6,233	33,800	17,732	4,600	70,733	.....	.....	.....	.....	4,800	75,533
December	5,516	4,323	30,645	9,678	3,580	53,742	.....	.....	.....	.....	4,645	58,387
January	8,387	6,613	21,968	14,678	11,096	62,742	.....	.....	.....	.....	6,129	68,871
February	5,787	3,713	29,143	4,000	5,750	47,393	.....	.....	.....	.....	3,750	51,143
March	10,032	1,611	21,338	7,324	8,774	49,129	.....	.....	.....	.....	6,355	55,484
April	5,133	.....	19,200	16,500	10,067	50,900	.....	.....	.....	.....	4,000	54,900
May	4,452	2,064	19,903	11,226	6,258	44,903	.....	.....	.....	.....	2,355	47,258
June	4,267	.....	25,100	6,333	3,500	39,200	.....	.....	.....	.....	.....	39,200
July	6,774	1,194	24,612	11,065	9,902	53,548	.....	.....	.....	.....	1,335	54,903
August	3,452	.....	16,419	7,419	4,290	31,580	.....	.....	.....	.....	968	32,548

AVERAGE DAILY IMPORTS OF CRUDE AND REFINED OIL AT PRINCIPAL UNITED STATES PORTS

Average barrels per day in 1930-31—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans, Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	38,867	8,533	150,933	34,500	25,567	258,400	6,433	12,234	.....	3,800	22,467	280,867
October	19,339	11,742	146,194	35,355	26,967	240,097	8,065	7,067	2,774	2,545	18,451	258,548
November	39,633	35,900	124,633	36,467	24,667	261,300	2,467	7,366	.....	1,767	11,600	272,900
December	21,419	14,033	122,774	32,839	33,774	224,839	6,290	10,613	2,097	290	19,290	244,129
January	17,613	13,519	154,225	33,902	30,613	248,871	3,033	11,677	2,097	3,097	18,903	267,774
February	31,321	16,939	127,786	31,714	26,857	254,607	4,536	11,571	.....	536	16,642	251,250
March	27,645	18,935	141,160	26,290	21,129	235,161	4,065	2,580	.....	1,968	8,613	246,774
April	35,000	10,533	105,000	29,767	35,533	215,833	2,733	3,400	.....	.....	6,133	221,966
May	30,129	8,774	107,000	25,452	26,710	198,065	.....	2,000	.....	.....	2,000	200,065
June	30,067	10,533	111,767	27,000	20,833	200,500	3,300	5,500	2,167	1,333	12,300	212,800
July	26,387	11,226	104,678	29,323	21,773	193,387	6,903	7,419	4,194	.....	18,516	211,903
August	32,613	15,581	91,742	22,387	25,741	188,064	4,161	2,516	.....	3,162	9,839	197,903

GROSS PRODUCTION OF CRUDE OIL IN THE UNITED STATES FOR 12 MONTHS

(In Barrels of 42 Gallons)

1930—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
September:	Month	17,984,306	16,509,120	23,111,822	3,405,510	1,583,280	2,008,060	3,239,010	3,396,000	71,237,108
	Daily average	599,477	550,304	770,394	113,517	52,776	66,935	107,967	113,200	2,374,570
October:	Month	18,244,063	18,632,523	23,626,553	3,517,913	1,636,552	2,142,885	3,335,550	3,637,000	73,707,039
	Daily average	588,518	536,533	762,147	115,223	52,792	69,125	104,050	117,000	2,345,388
November:	Month	18,169,469	14,941,770	22,035,222	3,459,330	1,557,870	2,136,948	2,957,100	3,322,000	68,419,699
	Daily average	605,648	498,059	734,507	115,311	51,929	71,231	98,570	107,400	2,280,656
December:	Month	17,786,728	15,067,103	21,810,359	3,432,661	1,590,951	2,167,534	3,118,663	3,328,000	68,281,999
	Daily average	573,765	485,713	703,560	110,731	51,321	69,598	100,602	107,355	2,202,645
1931—										
January:	Month	16,485,738	14,859,953	20,019,312	3,432,475	1,574,955	2,135,037	2,966,142	3,374,000	64,838,513
	Daily average	531,798	479,063	645,781	110,725	50,805	68,872	95,682	108,839	2,091,565
February:	Month	14,930,932	13,531,930	18,957,571	3,341,016	1,402,492	1,981,616	2,747,024	3,139,000	60,031,631
	Daily average	533,248	483,355	677,057	119,322	50,089	70,772	98,108	111,750	2,143,629
March:	Month	16,364,843	16,627,687	22,453,610	3,498,598	1,469,245	2,061,576	2,898,035	3,374,000	68,747,602
	Daily average	527,898	536,377	724,310	112,858	47,395	66,502	93,485	108,839	2,217,665
April:	Month	15,803,541	16,815,990	26,887,717	3,231,880	1,412,220	2,068,021	2,901,870	3,373,000	72,384,239
	Daily average	526,785	559,355	896,257	109,396	47,074	66,934	96,729	109,100	2,412,808
May:	Month	16,448,960	17,333,867	28,708,684	3,341,366	1,446,374	2,232,568	3,098,419	3,190,000	75,800,138
	Daily average	530,612	559,157	926,086	107,786	46,654	72,018	99,948	102,900	2,445,166
June:	Month	15,641,436	16,673,200	29,139,833	3,175,440	1,344,450	1,850,511	2,986,200	3,186,000	73,982,070
	Daily average	521,381	555,940	971,327	105,848	44,815	61,684	99,540	105,533	2,466,069
July:	Month	16,093,322	16,467,789	33,837,213	3,090,762	1,387,430	1,715,730	2,905,909	3,341,000	78,739,155
	Daily average	519,139	531,219	1,091,200	99,702	41,530	55,345	93,739	107,774	2,539,650
August:	Month	15,668,984	9,678,510	32,379,816	3,148,887	1,165,445	1,584,444	2,807,143	3,167,000	69,500,229
	Daily average	505,451	312,210	1,041,284	101,577	37,595	51,111	90,553	102,161	2,241,943
Total 12 months		199,562,301	185,125,492	302,857,621	40,179,838	17,471,164	24,014,930	35,851,065	39,587,000	844,649,411
Daily average		546,748	507,193	829,747	110,082	47,866	65,794	98,223	108,458	2,314,109

15 Cents

The Oil and Gas Journal

PRODUCING REFINING PIPELINE ENGINEE... ...G

Published Every Thursday TULSA, OKLAHOMA, NOVEMBER 26, 1931

ANN ARBOR MICHIGAN
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—After a Famous French War Poster by SEM

"My right is in retreat; my center is yielding; situation excellent. I SHALL ATTACK!"

—MARSHAL FOCH

WHEN the retreating French Army was faced with almost certain defeat, that military genius, Foch—with abiding faith in the fighting spirit of his country—led his men in attack. His decisive, stirring message, quoted above, was indicative of his courage.

With this same courage the Oil Industry is changing its strategy. The retreat is over; the center is no longer yielding; the attack that will bring "better days" is under way. The oil men of this country are too big and too capable to be put down and out by any individual condition, or set of conditions.

With 59 years of manufacturing experience as a background, we recall periods similar to the one existing now. We remember the early days of the petroleum industry, when struggling for existence, it reached out for better equipment and more effective methods, striving to make finer products and to render more worthy service. The result was a period of greater prosperity than the mind of man could possibly foretell.

Co-operative planning and building for tomorrow is the best remedy to prevent "chronic depression"—further dissension and price-cutting can breed only disruption and chaos.

During the past year BJ engineers have been developing tools for tomorrow. Field tests have proved them worthy to bear the BJ Quality Mark, and stocks are ready in advance . . . for those "better days" so sure to follow. At that time, as at present and in the past, you will find us ready to serve.

BYRON JACKSON CO.

FORT WORTH LOS ANGELES NEW YORK

BJ *Established 1872*

Advertisers' Index on Page 9 Table of Contents on Page 10

A "CATERPILLAR" mounted winch goes where you want it—and when. Everywhere on the lease—hauling, swabbing, fighting fire, digging sumps. The Thirty pictured, winch-equipped, is swabbing an East Texas well—a few days before it performed gallantly at the famous Gladewater fire—tomorrow the mobility of the outfit will find some new and profitable job.

Prices—f. o. b. Peoria, Illinois

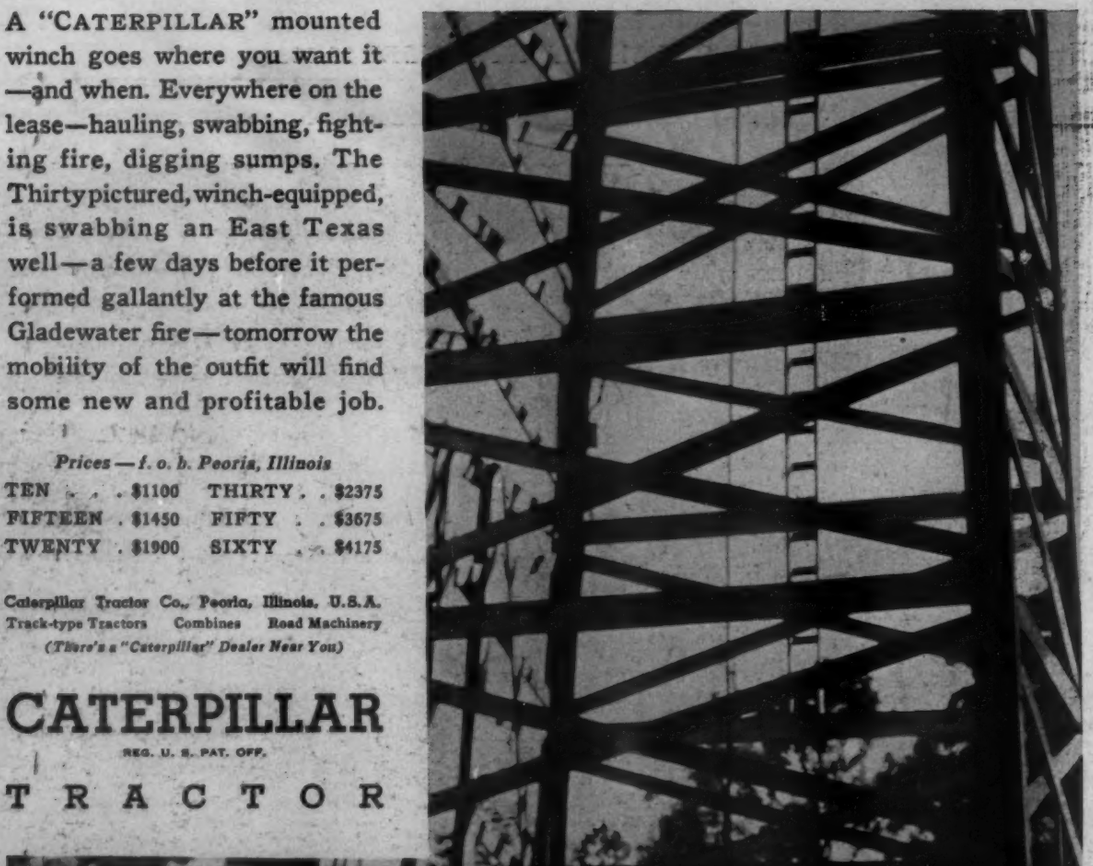
TEN	$1100	THIRTY	$2375
FIFTEEN	$1450	FIFTY	$3675
TWENTY	$1900	SIXTY	$4175

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.
Track-type Tractors Combines Road Machinery
(There's a "Caterpillar" Dealer Near You)

CATERPILLAR

REG. U. S. PAT. OFF.

TRACTOR



MOBILITY

Proved by Years of Performance
. . . THE KEWANEE FLANGE UNION

Where service conditions are hard and tight joints imperative, engineers play safe by insisting upon the Kewanee Flange Union . . . Fig. 8301. Note these advantages:

Iron to bronze seat, insuring leakless joint.

Loose flange, permitting swiveling to any position to match bolt holes.

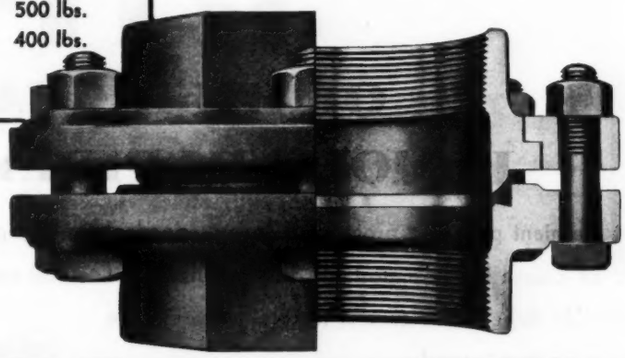
Light weight combined with extraordinary strength and rigidity.

Only sterling performance over many years could have won the Kewanee Flange Union's world wide reputation for quality.

Kewanee All-Iron Malleable Flange Union (Fig. 8302) also available.

SERVICE RECOMMENDATIONS

	Working Steam Pressure	Cold Water Oil and Gas Pressure
Sizes 1" to 4" inclusive	300 lbs.	800 lbs.
Sizes 5" and 6"	250 lbs.	500 lbs.
Sizes 8" to 12" inclusive	200 lbs.	400 lbs.



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VALVES FITTINGS AND TOOLS

The Oil and Gas Journal, issued weekly by The Petroleum Publishing Company, 114-116 West Second Street, Tulsa, Oklahoma. Subscription price $6.00 a year; 15 cents a copy. Entered as second-class mail matter December 15, 1911, at the post office at Tulsa, Okla., under the Act of March 3, 1879.

PIPE

OF HIGH CHARACTER
IS MORE RAPIDLY INSTALLED

In carrying out the giant pipe-line projects of today, speed of construction is of course highly important. The completion of the job on schedule depends on several factors, including the character of the pipe that is used.

Bethlehem Steel Pipe meets ideally the requirements for rapid pipe-line construction. Its straight, uniform sections, smoothly-finished ends and tight, strong welds, together with the easy-working quality of the steel, help to speed up the laying of the line. To promote speed of installation further, Bethlehem is prepared to furnish line pipe in double random lengths.

The large and increasing tonnages in which it is being used in pipe-line construction are evidence of the confidence felt by oil and gas companies in Bethlehem Steel Pipe.

Bethlehem maintains at Houston, Texas, and Wilmington, Calif., well-assorted stocks of line pipe, ready for immediate shipment. Both threaded and coupled and plain-end pipe are included in these stocks.

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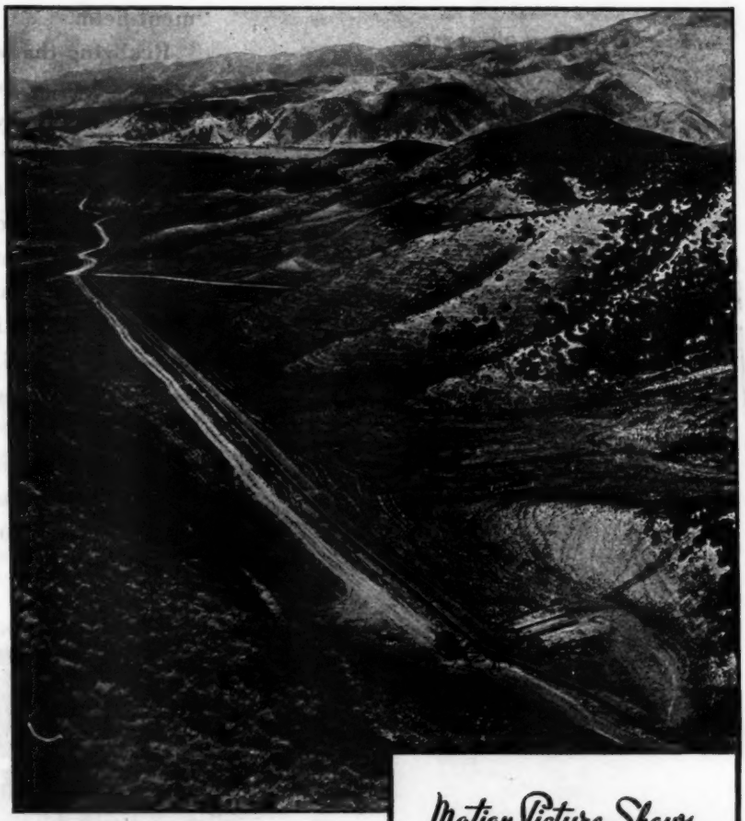
BETHLEHEM STEEL

BETHLEHEM

LINDEWELDING

brings contractor more business



A contractor using Lindewelding on a 29-mile section of 8-inch oil line completed his part of the job so far ahead of schedule that the oil company gave him 51 additional miles to do.

Lindewelding means greater profits for any contractor because it makes high-strength joints 30 to 60 per cent. faster and with 35 to 40 per cent. less welding material.

Experienced welders quickly adapt themselves to this new method of oxy-acetylene welding, and beginners learn it more readily than other methods. It can be done with an ordinary blowpipe or with special apparatus which further increases speed by making the welding almost automatic.

Procedure Controls for Lindewelding are available to all users of Linde Oxygen. If faster welding, lower costs, and stronger joints would win more business and bigger profits for your company, ask our nearest district office for complete information today.

Motion Picture Shows details of Lindewelding

Lindewelding technique differs from neutral flame welding technique in that it employs a special rod, a special flame adjustment, and the "back-hand" method of blowpipe manipulation. The actual steps in making a Lindewelded joint are shown in our motion picture, "The Lindeweld Process for Pipe Line Construction." This picture will be loaned without charge to pipe line officials and welding or engineering societies. It is furnished in 16mm. and 35mm. safety film and can be obtained by writing to any Linde District Office.

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Unit of Union Carbide and Carbon Corporation

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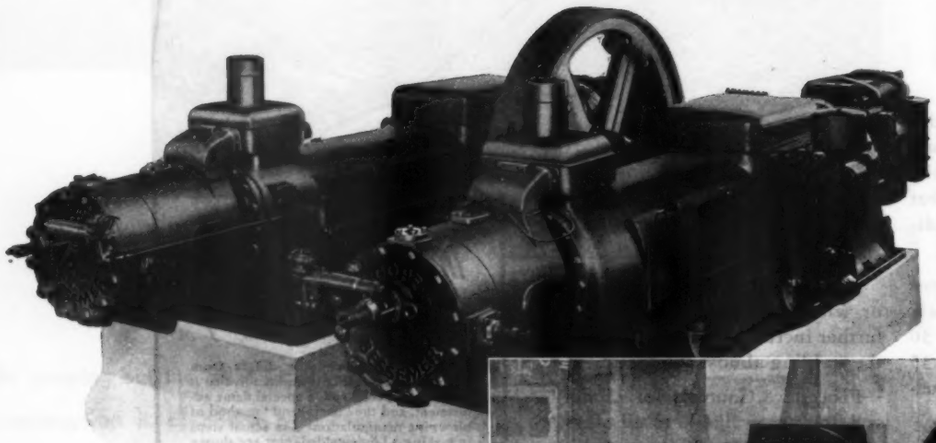
...assures efficiency in COOPER-BESSEMER Compressors

SINCE 1898 the Cooper-Bessemer Corp., by designing dependable equipment and by employing highest quality materials, has maintained a position as an important factor in the power equipment field.

Realizing that efficiency in compressors with parts subjected to pressures as high as 1000 lbs., is determined largely by the type of materials employed, Cooper-Bessemer engineers use Nickel Cast Iron for compressor cylinders, liners, heads and pistons.

Nickel Cast Iron, with its superior wear-resisting properties, is contributing in a large measure to the efficient and economical performance of these compressors. In this instance a high Brinell hardness is obtained in castings that are easily machined. The use of Nickel in amounts upward of 2.0%, depending upon the design of the casting and its operating requirements, is safeguarding the good reputation of these machines.

Nickel Cast Iron is a better cast iron. Higher and more uniform properties are provided at a cost only slightly greater than that of ordinary cast iron.



Left: New type 10, gas engine driven compressor, twin cylinder—200 b. h. p. at 200 r. p. m., manufactured by COOPER-BESSEMER CORP., Grove City, Pa.

Nickel Cast Iron cylinders, liners, heads and pistons used in COOPER-BESSEMER compressors

Our foundry specialists will gladly discuss your casting problems with you.

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FOR CAST IRON

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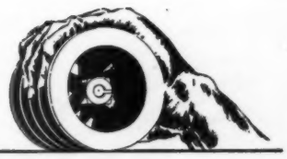

Its *grip* is flexible . . . yet positive

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IN power transmission, the combination of flexibility and positive drive always has been a difficult one to achieve. Belt slippage has usually accompanied any means of absorbing shock loads and vibration. And devices to prevent slippage have sacrificed elasticity or built up excessive bearing pressures.

With the Worthington Multi-V-Drive, however, this ideal union of flexibility and positive drive has been realized, even when applied to extremely close centers.

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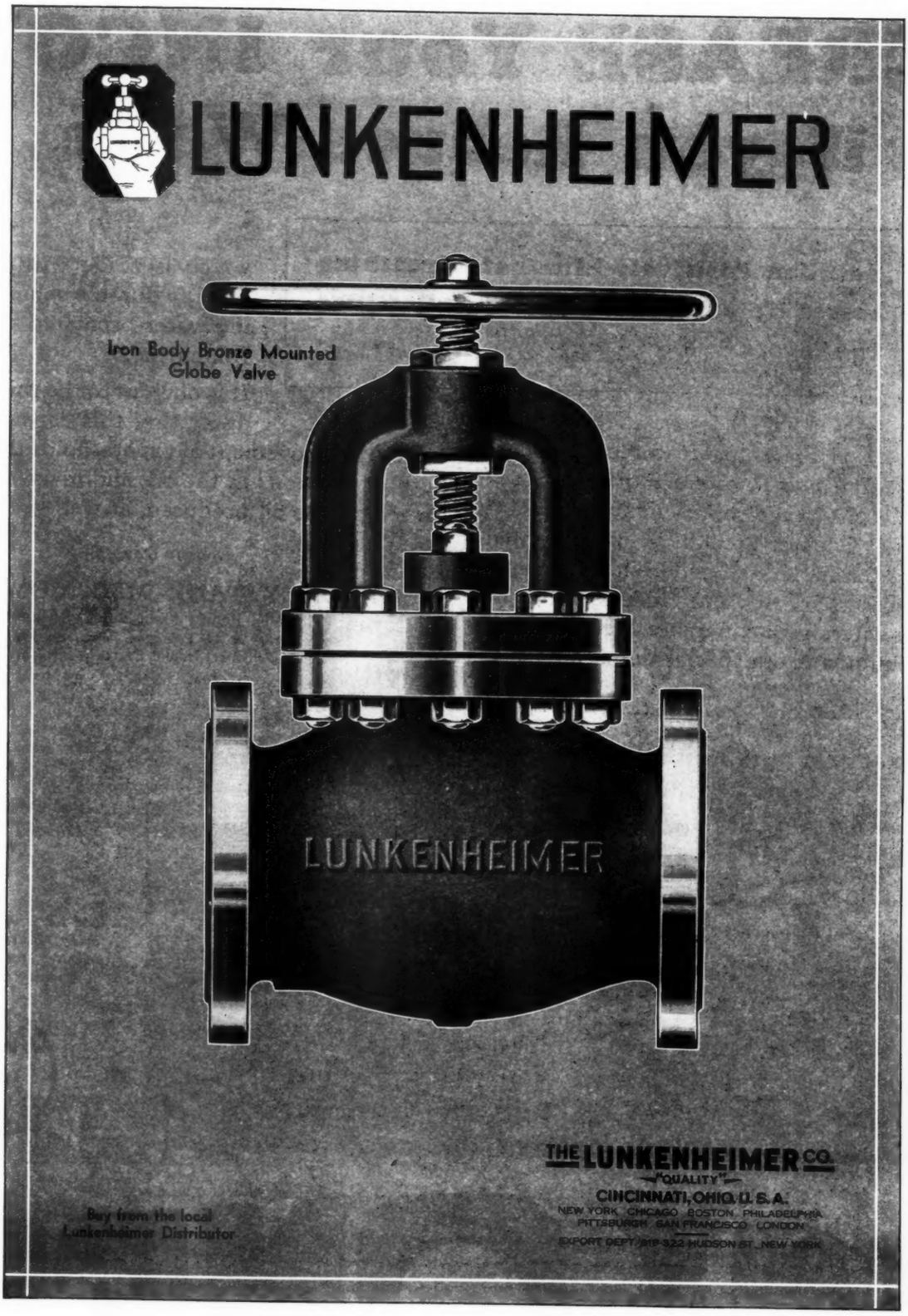
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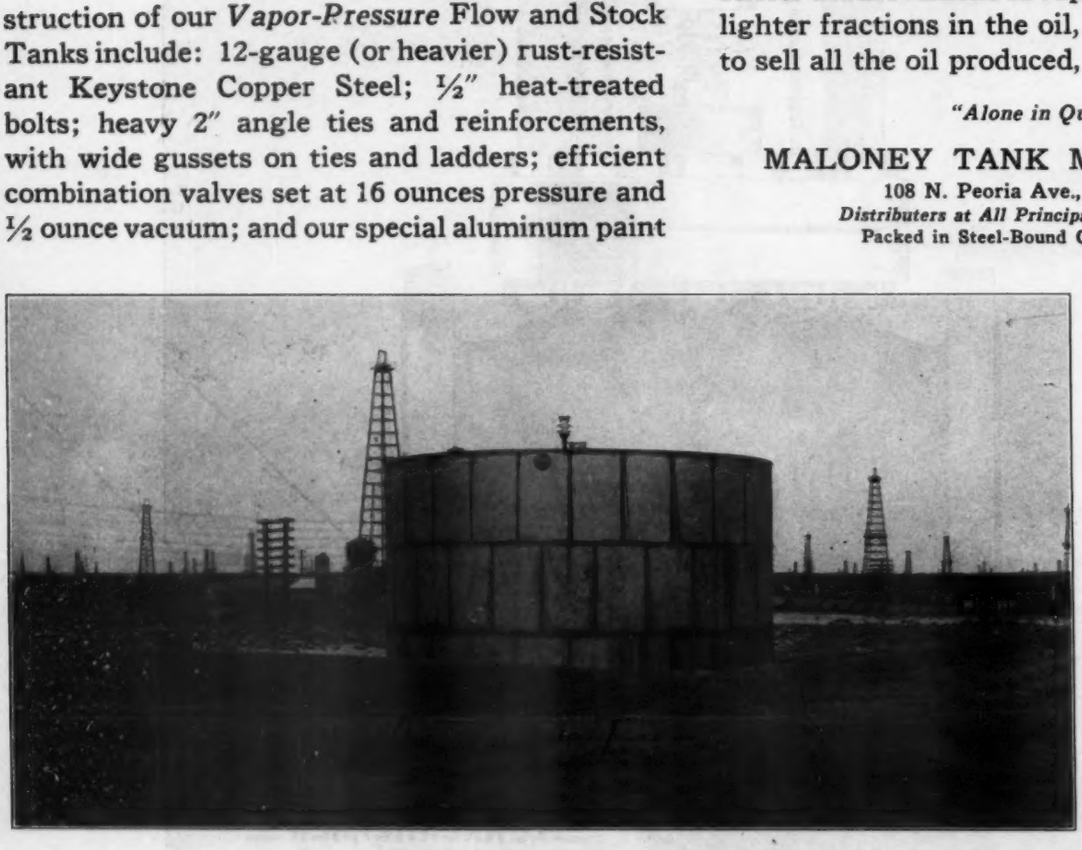

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(At left) A 5,000 Bbl. Maloney Bolted Steel Tank used for storage in the Oklahoma City Field.

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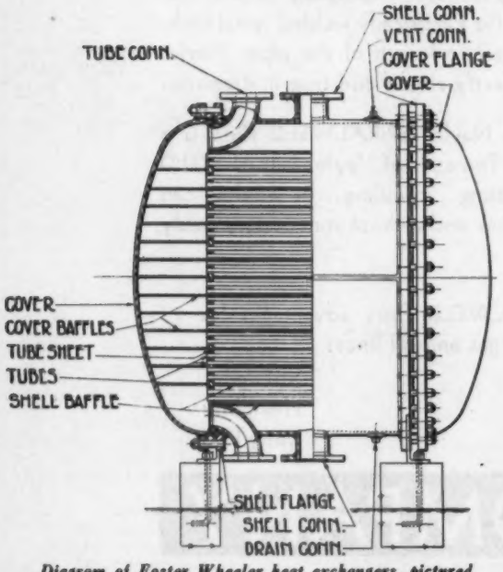

Diagram of Foster Wheeler heat exchangers, pictured above. The cover plates may be removed without disturbing tube connections.

The heat exchangers, coolers and condensers of this Foster Wheeler installation are of the short tube, cross flow type. They provide a high rate of heat transfer, as the design incorporates the following features:

1. Flow is absolutely counter-current.
2. Baffles are welded into shell, thus preventing by-passing around heating surface.
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FOSTER WHEELER

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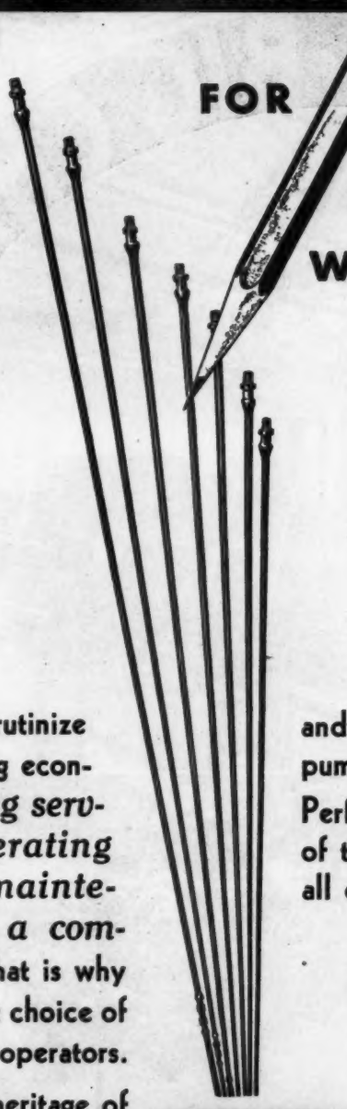
The 12th of a series and the 3rd on sucker rods



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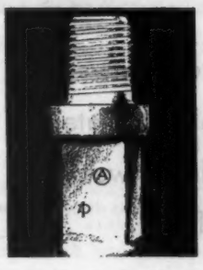

RECORD NO. 1
Rods installed Sept. 25, 1931.
Tubed to 7200'.
Tubing 2½" and 2".
Pump—Axelson Traveling Tube Insert Cup.
No breaks to date.
Fourteen months of continuous operation.
Production 205 bbls. per day.

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Tubing 2½".
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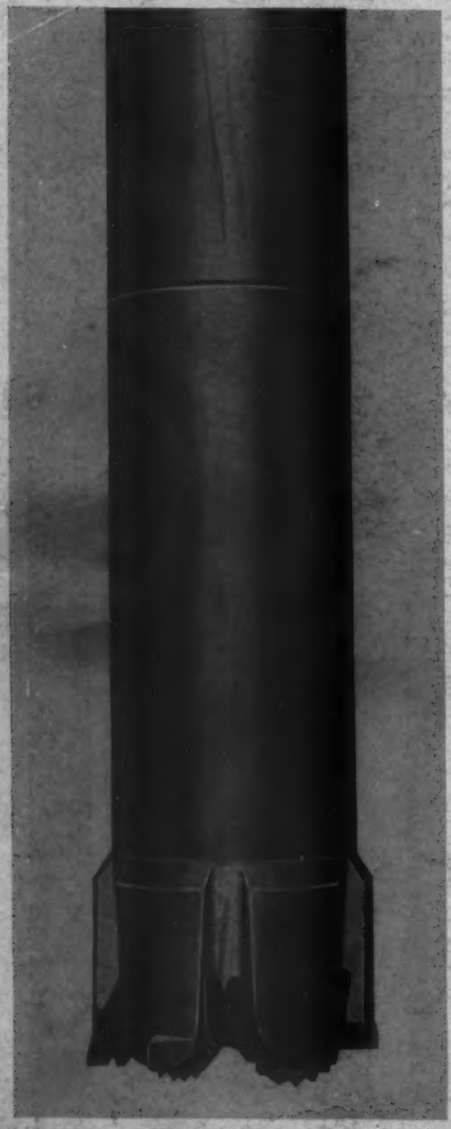

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